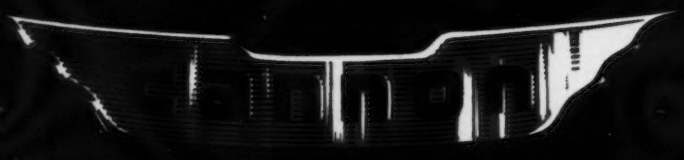
Gas Journal

VOL. 281. 107th YEAR. LONDON, MARCH 2, 1955. Nº 4787. PRICE 1/3



at the Ideal Home Exhibition

Stand 48

Ground Floor Grand Hall Olympia

GAS COMPRESSORS

150 YEARS OF ENGINEERING EXPERIENCE GOES INTO THE MANUFACTURE OF OUR PRODUCTS

Illustration by courtesy of N.C.B.

A recent installation of three 8" Stroke Vertical Reciprocating Compressors, each machine capable of passing 87,500 cubic feet of gas per hour, against 20 lb. per square inch outlet pressure, running at 450 r.p.m., direct coupled to a National Vertical Oil Engine.

Made by...

THE BRYAN DONKIN COMPANY LTD. CHESTERFIELD

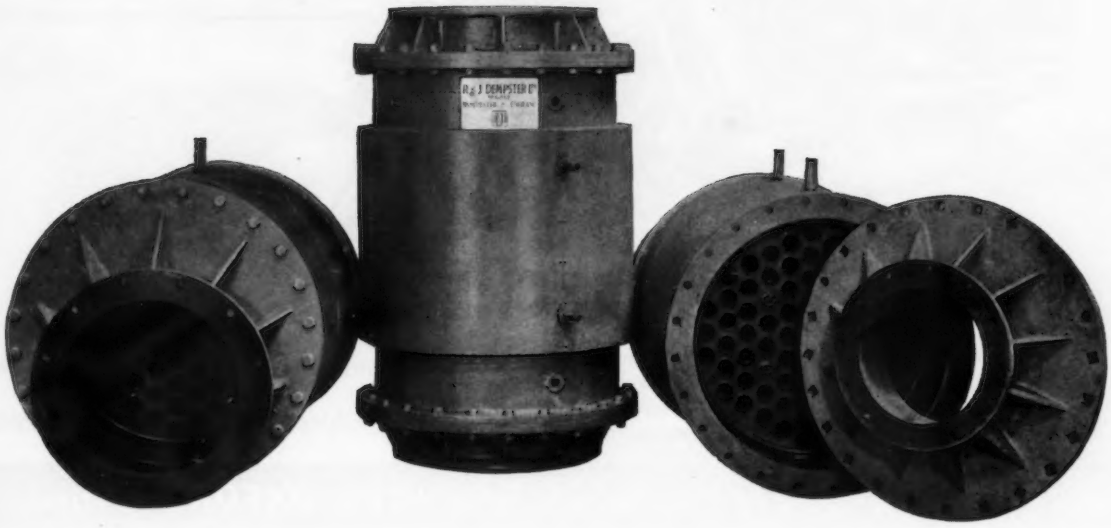
MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES

Useful gasworks equipment

GAS PREHEATERS

by DEMPSTERS of MANCHESTER

The hallmark of high quality plant



Our gas preheaters, illustrated above, can be supplied in various sizes to suit your own particular capacity requirements.

They are so constructed that the tubular heating element may be easily withdrawn or inserted, when necessary, for the purpose of cleaning or replacing the tubes.

These preheaters are notable for their high rate of heat transference.

Your orders and enquiries will be welcomed by :

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DEMPSTER
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Constructional Gas and Chemical Engineers
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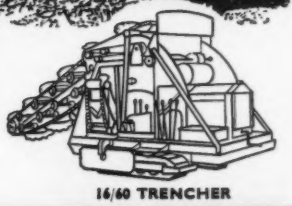
12/21 MODEL FOR NARROW TRENCHES

The answer to all your trenching problems

ALLEN *Super Duty* TRENCHERS

For narrow trenches we supply the 12/21 model, and for wide trenches the 16/60 model. Both models are a fine engineering job and capable of standing up to continuous hard work. We shall be pleased to send you further information and fully illustrated brochures on request.



16/60 TRENCHER

JOHN ALLEN & SONS (OXFORD) LTD. COWLEY OXFORD *Tel 77155/6/7*

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Head Office:
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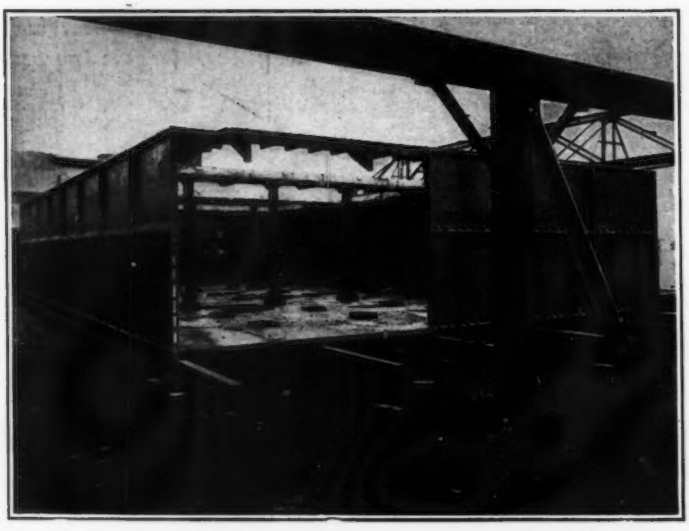

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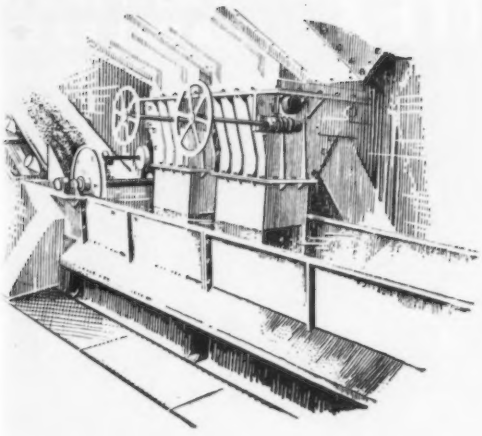
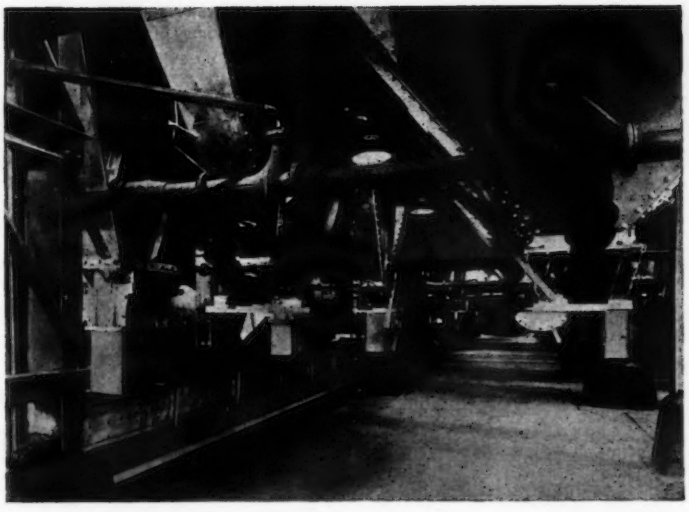


Mechanised, continuous, and dustless removal of ash residues from all types of boiler plants, refuse disposal plant, gas retorts, locomotive ash pits and the like, is provided for in the design of the John Thompson Submerged-Belt Ash Conveyor.

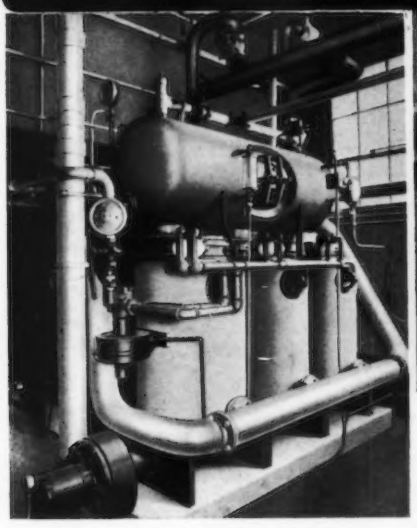
The operation of this conveyor system is described in a leaflet which we have just published; copies of this leaflet will be sent to all engineers who are interested in this particular kind of plant.



JOHN THOMPSON CONVEYOR COMPANY
JOHN THOMPSON GROUP

JOHN THOMPSON CONVEYOR COMPANY
ETTINGSHALL, WOLVERHAMPTON

THE "VESTA" & "VERTEX" GAS FIRED BOILERS



Photographs by Courtesy of Wembley Stadium, Ltd.

WEMBLEY STADIUM

The Boiler Plant consists of TWO B.3 "VESTA" GAS FIRED BOILERS fitted with horizontal overhead steam drums, having a total capacity of 1,350,000 B.T.U.'s per hour.

The plant supplies low pressure steam through calorifiers, hot water for wash basins, showers and baths in the New Dressing Rooms of the Main Sports Arena.

Consulting Engineers: Sir Owen Williams & Partners
Heating Specialists: James Combe & Son Ltd.

FULLY ILLUSTRATED BROCHURE FORWARDED ON REQUEST

WE ARE ALSO THE MANUFACTURERS OF
The
"VERTEX"
GAS FIRED BOILER
DESIGNED FOR SMALLER INSTALLATIONS

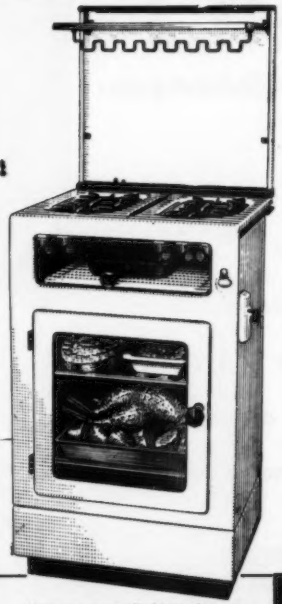
AUTOCONTROL BOILERS LTD.
167 TEMPLE CHAMBERS, TEMPLE AVE., LONDON, E.C.4
PHONE CENTRAL 7821
TELEGRAMS "AUTOCONTROL" CENTRAL 7821, LONDON

Kitchen-wise women choose

Vulcan

The glass door cooker with the *Extra* features!

Popular though it is, the non-misting glass door is but one reason why so many women decide on a VULCAN. They see the handy plinth drawer . . . self-locating grill pan . . . easy-to-clean finish inside as well as out. With its smooth-fitting, light-weight parts, the VULCAN is so easy to look after!



- *Fully-guaranteed Armourplate glass door.*
- *Retains full oven heat, can't steam over.*
- *Automatic regulator gives* double control.
- *Roomy plinth drawer.*
- *Self-locating grill pan.*
- *Fully-furnished oven.*
- *Good choice of finishes and oven capacities.*

Vulcan *DOUBLE-CONTROL*
GAS COOKERS
THE VULCAN STOVE CO. LTD · EXETER
Telephone: EXETER 5301-2 *Telegrams:* VULCAN EXETER
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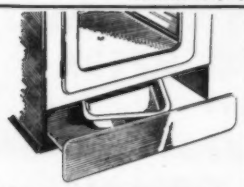
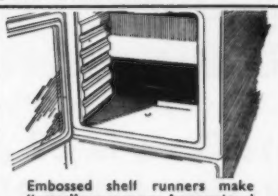


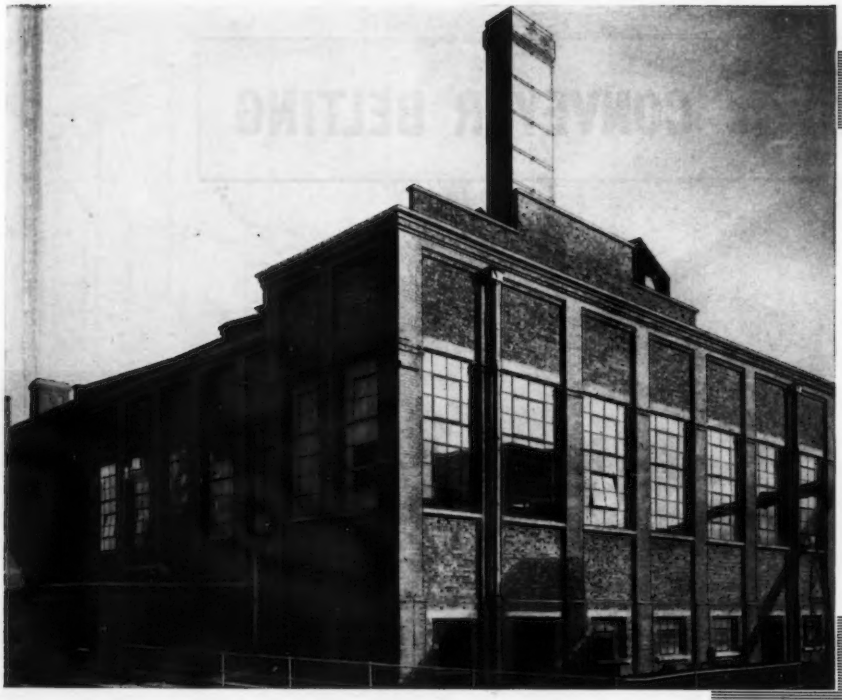
The Vulcan's plinth drawer is really useful for getting pans, shelves and utensils out of the way.



Embossed shelf runners make "gates" unnecessary. An occasional wipe with a damp cloth keeps this oven spotless.

Vitreous enamelled hot-plate sections carry the spillage pans, which prevent contamination of the burners. Parts lift off easily for cleaning.

Point out these Vulcan advantages
YOUR SALES WILL BENEFIT!



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COAL AND COKE HANDLING PLANT

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Manufacturers of :—

- Complete range of refractory goods for gas retort settings and coke ovens in fireclay, silica and siliceous qualities.

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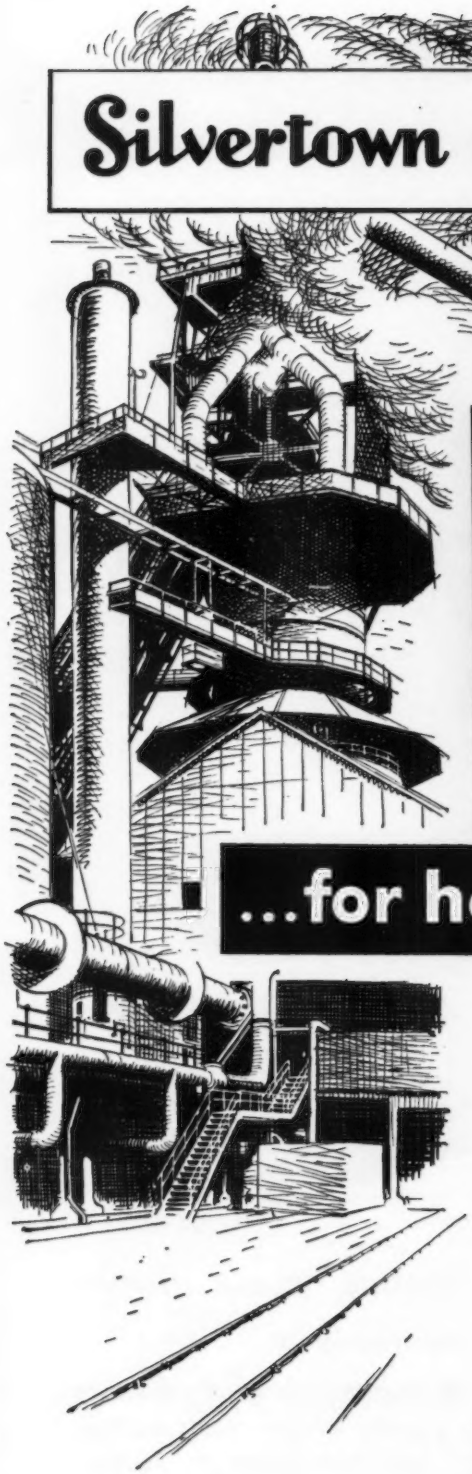
Silvertown CONVEYOR BELTING



...for hot coke

Silvertown has vast experience in the making of conveyor belts for hot materials—such as hot castings, hot sand and hot cement clinker. But hot coke presents a special problem—its high degree of abrasiveness which, even more than its heat, can be so destructive of conveyor belting.

To meet this problem there is no better choice than Silvertown Grade Super A belting . . . a heat resistant belting of exceptional toughness which, for the conveyance of hot quenched coke in steel works and gas works, has proved itself unequalled for "life" and economy.

★ **If hot coke is wearing out *your* belts too quickly — specify Silvertown Grade Super A.**

THE INDIA RUBBER, GUTTA PERCHA & TELEGRAPH WORKS CO. LTD
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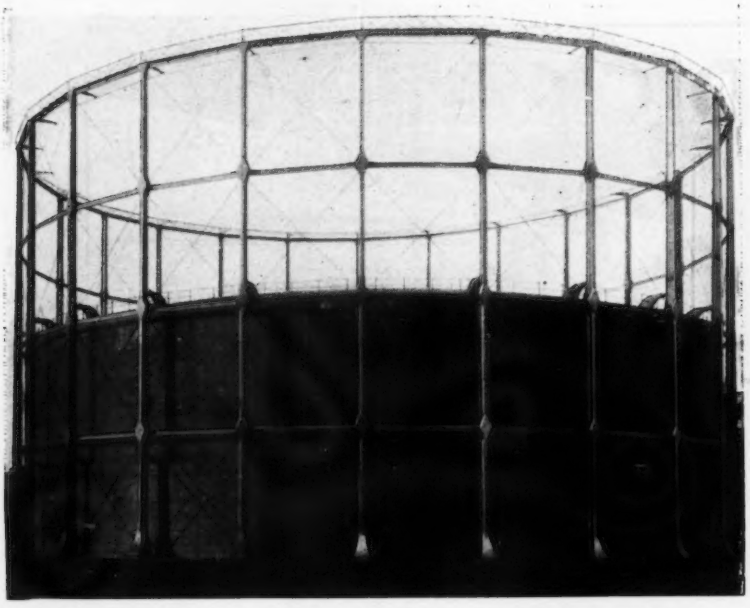

3-LIFT FRAME GUIDED GASHOLDER 205' DIA. × 40' DEEP, 3⅜ MILLION CU. FT. CAPACITY. BATH

181

GASHOLDERS

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80 YEARS EXPERIENCE

Unequalled Service

GASHOLDERS AND TANKS OF ANY SIZE AND DESIGN RIVETTED OR WELDED

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Fuel Saved

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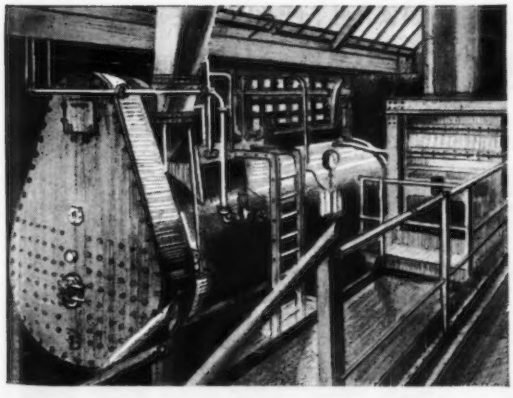

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Already more than 3,500,000 tons of fuel are saved annually by Spencer - Bonecourt installations designed to meet the needs of diverse industries. A survey of your Works might reveal possibilities of a major reduction in the fuel account to your own and the national advantage.

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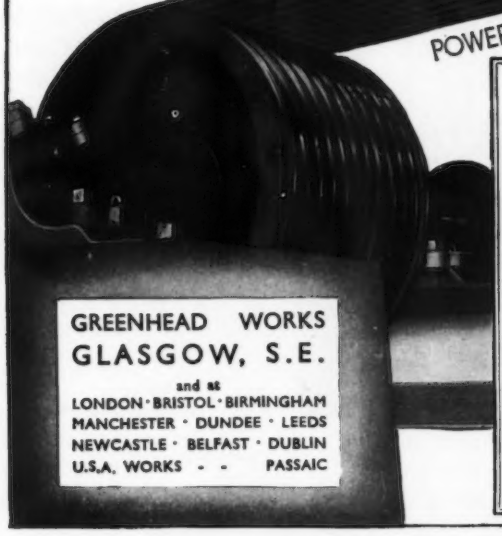

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"DICK'S ORIGINAL" BALATA Belts
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"DICKROPE"
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OR BY
SEPARATE MOTOR AND BELT
WITH ACCESSORIES FOR SPECIFIC DUTIES

THOMAS BROADBENT & SONS LTD.

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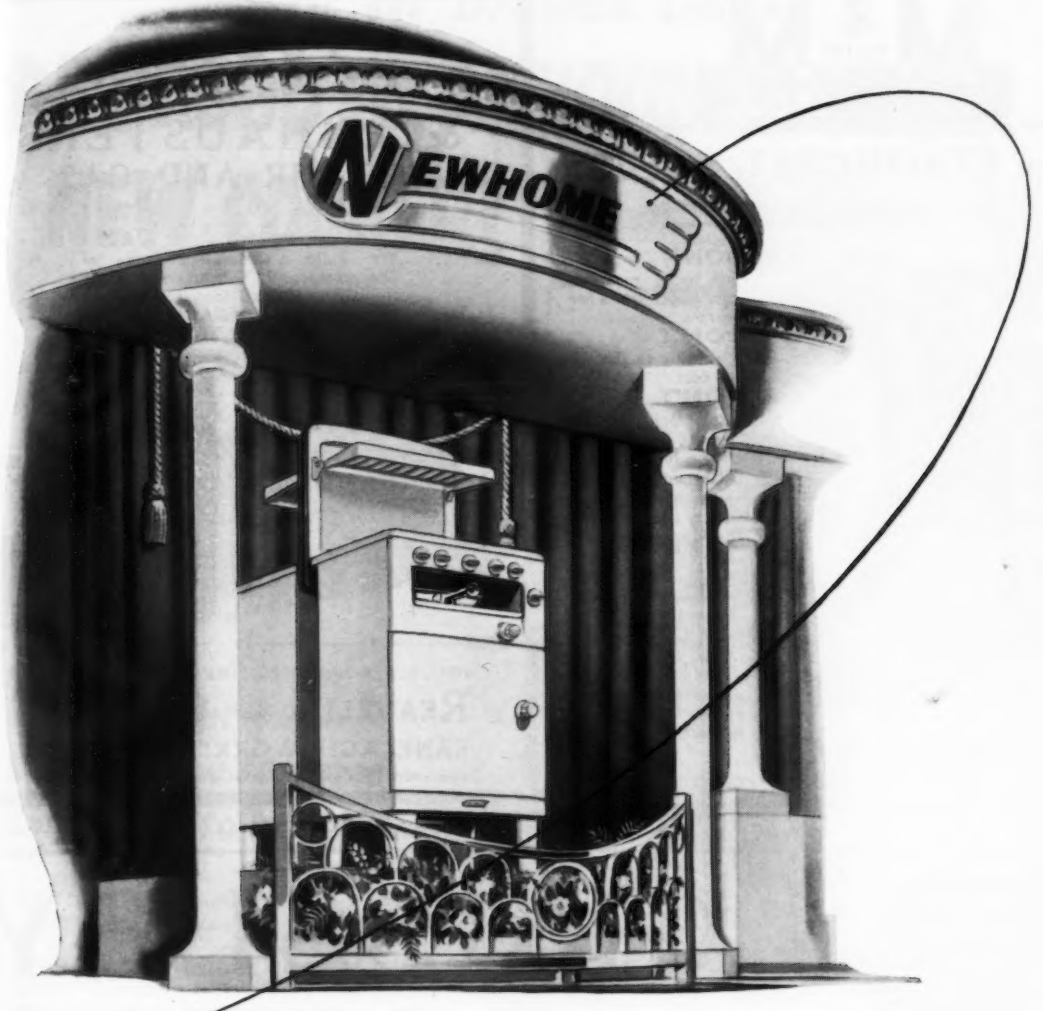

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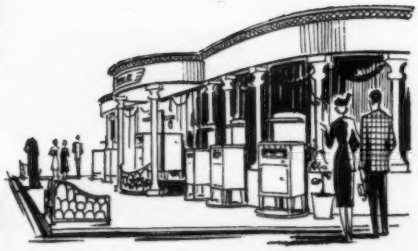

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use the STRONGEST, SAFEST METER LOCK

- DON'T buy locks you may have to scrap in a few years
- DON'T look only at the initial cost
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- DO remember that good quality is cheapest in the long run
- DO take our word for it that our workmanship is consistently good
- DO profit by others' experience and use M. & M. Locks to protect your meters

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TURBO-COMPRESSORS & EXHAUSTERS FOR AIR AND GAS

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We build a complete range of Compressors & Exhausters for air and GAS, suitable for all purposes connected with the GAS industry, including Turbo-Compressors for large capacities, as illustrated below

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REAVELL & CO., LTD.,
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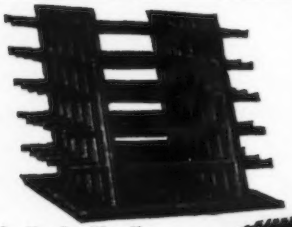
Telegrams: REAVELL, IPSWICH Telephone: 2124 & 5.

CROSSLEY GRIDS

for

PURIFIERS, SCRUBBERS AND WASHERS



Inclined Hurdles (Light or Heavy Type) with Bottom Flat Grids.

Scrubber Grids.

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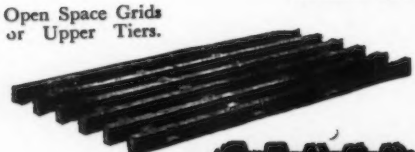

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Flat Grids for Bottom Tiers (Closed Ends).

Embody the latest improvements—are of the very best quality—and are in use extensively throughout the Kingdom

Send your enquiries for any kind of Grids to:—

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Telephone: BLACKPOOL 51005 (2 lines). *Telegrams:* "WOODWARE, BISPHAM."

GENERAL GAS APPLIANCES LIMITED

ARE PROUD TO ANNOUNCE THEIR NEW COOKER!

The Crusader

The Crusader—with 5 brand new features—campaigns to help women

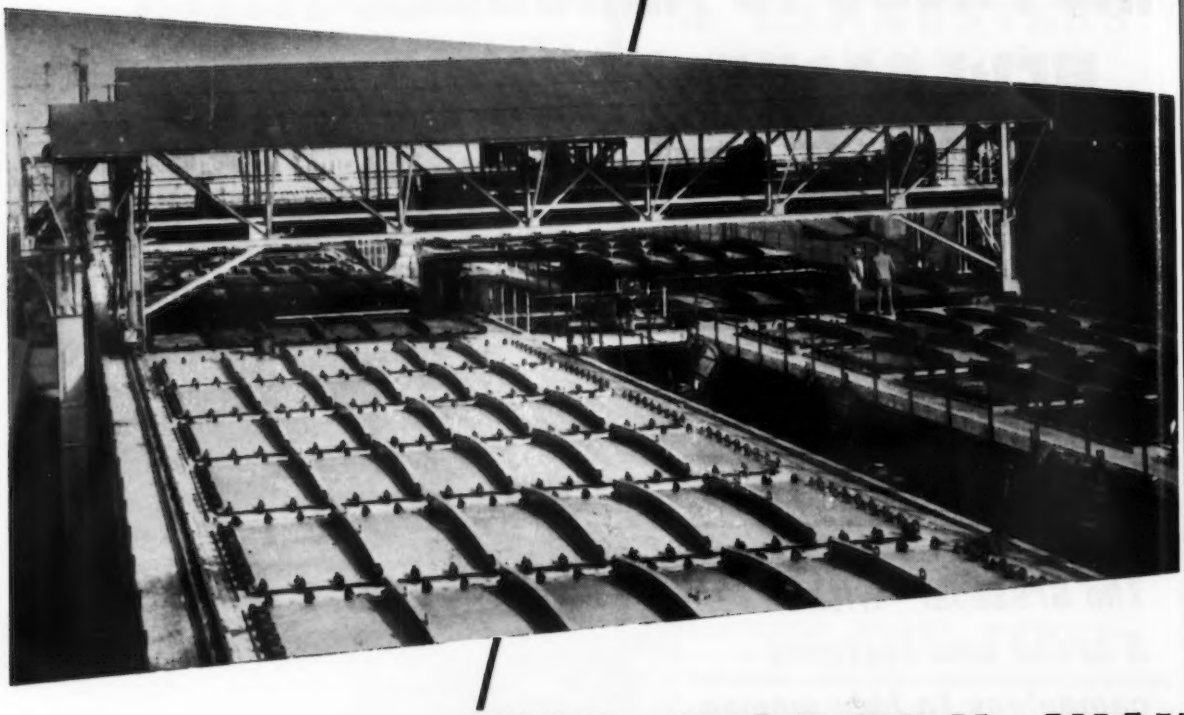
- **Flat hotplate**—on which pans can be placed in any position without spilling or tipping.
- **Oven flue vented through front of splashplate.** This prevents walls being heat marked, and warms plates in double shelf rack.
- **Burners enclosed in special tray** safeguarding grill from splashes.
- **All hotplate parts lift off** for easy cleaning.
- **Recessed toe space** protects base from marking and scuffing.

Your customers may choose this handsome cooker in any of these fine vitreous enamel finishes. All white, all cream, eau-de-nil and cream, white and grey. They'll admire the Crusader's push-in type safety taps on the facia panel, the fingertip thermostat oven control and the fully equipped oven, finished in light grey enamel.

THE CRUSADER SELLS ITSELF!

Made by
GENERAL GAS APPLIANCES LIMITED
AUDENSHAW, MANCHESTER
Proprietors: Allied Ironfounders Ltd.

OXIDE HANDLING



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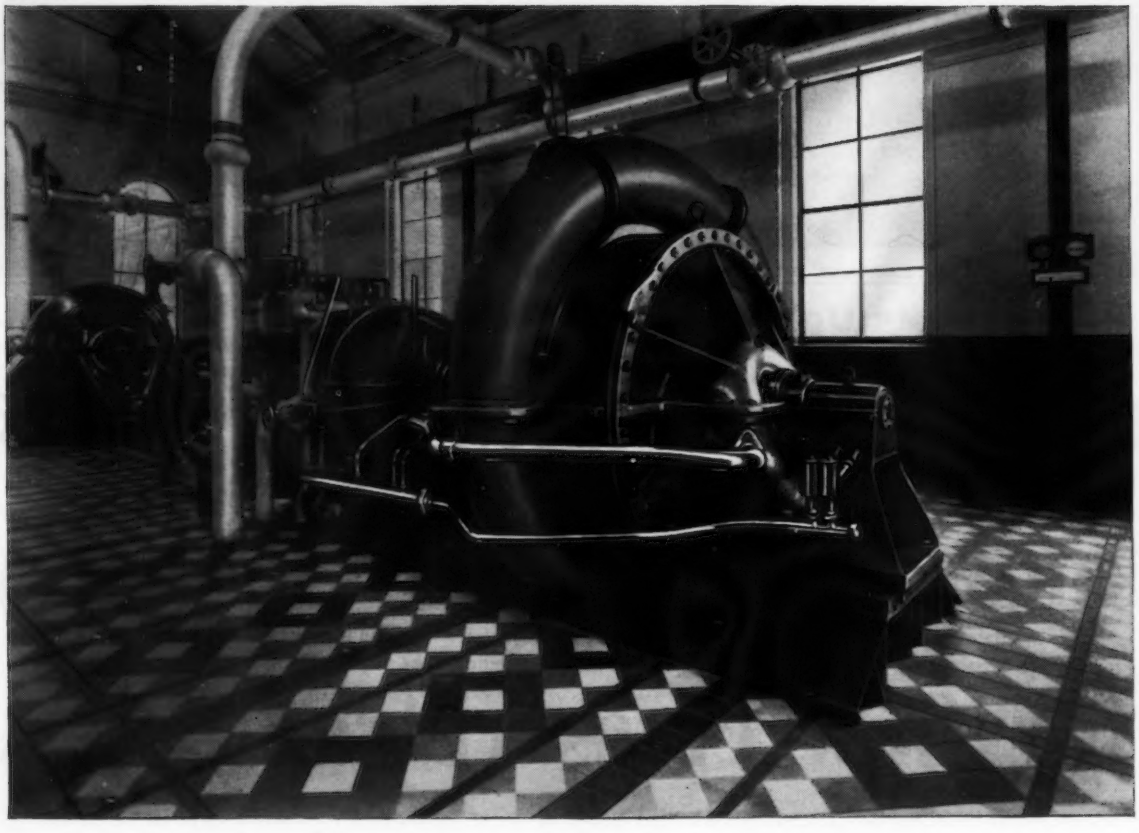
CENTRIFUGAL COMPRESSING PLANT

for collieries, gas works, and general industrial purposes



BTH manufacture turbine and motor-driven centrifugal compressors, blowers, boosters and exhausters of various capacities. This BTH turbine-driven gas booster is installed at the Fulham works of the North Thames Gas Board; it is rated for continuous service at 2,000,000 cubic feet per hour.

BRITISH THOMSON-HOUSTON

THE BRITISH THOMSON-HOUSTON COMPANY LIMITED · RUGBY · ENGLAND

Member of the AEI group of companies

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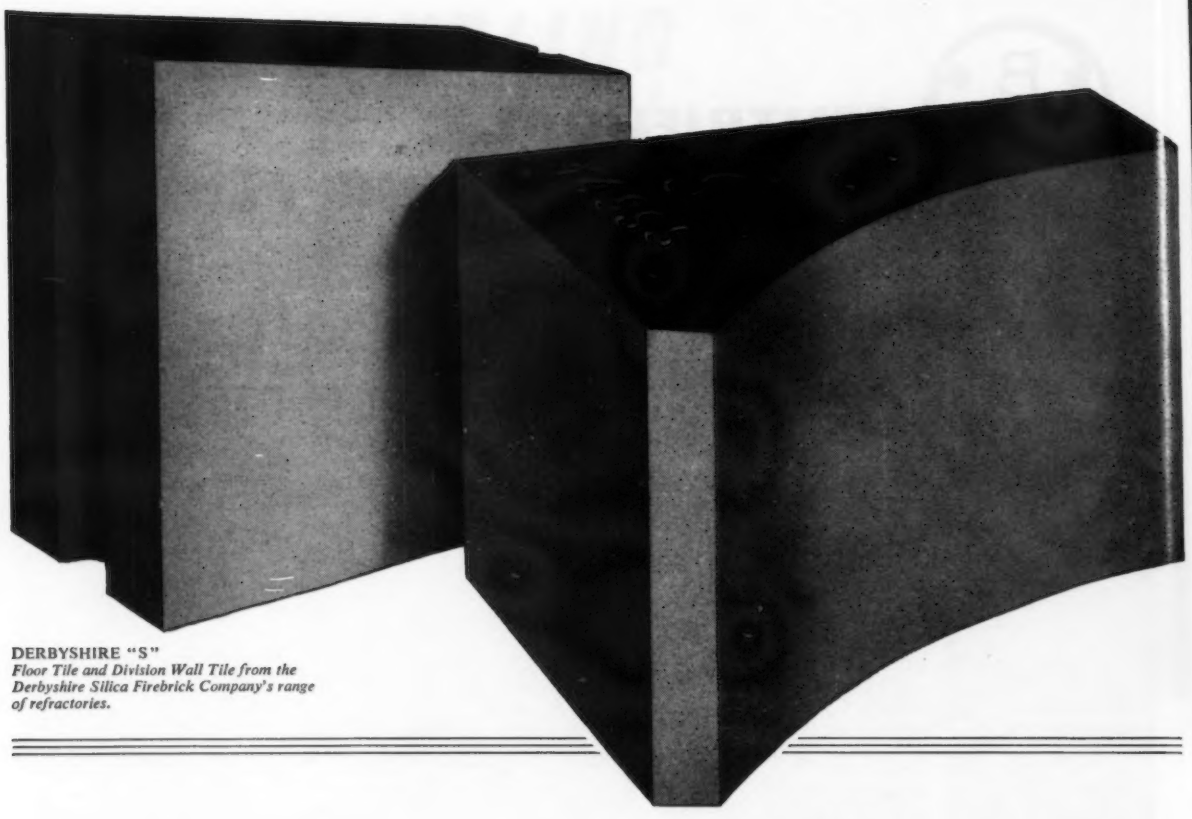

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Floor Tile and Division Wall Tile from the Derbyshire Silica Firebrick Company's range of refractories.

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DERBYSHIRE "S" and "D.S.F."
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Refractories for all purposes including Vertical and Horizontal Retorts, Soakers, Puddling Furnaces, Reheating and Annealing Furnaces, Forge Furnaces, Checkers, Cupolas and Glass Furnaces.

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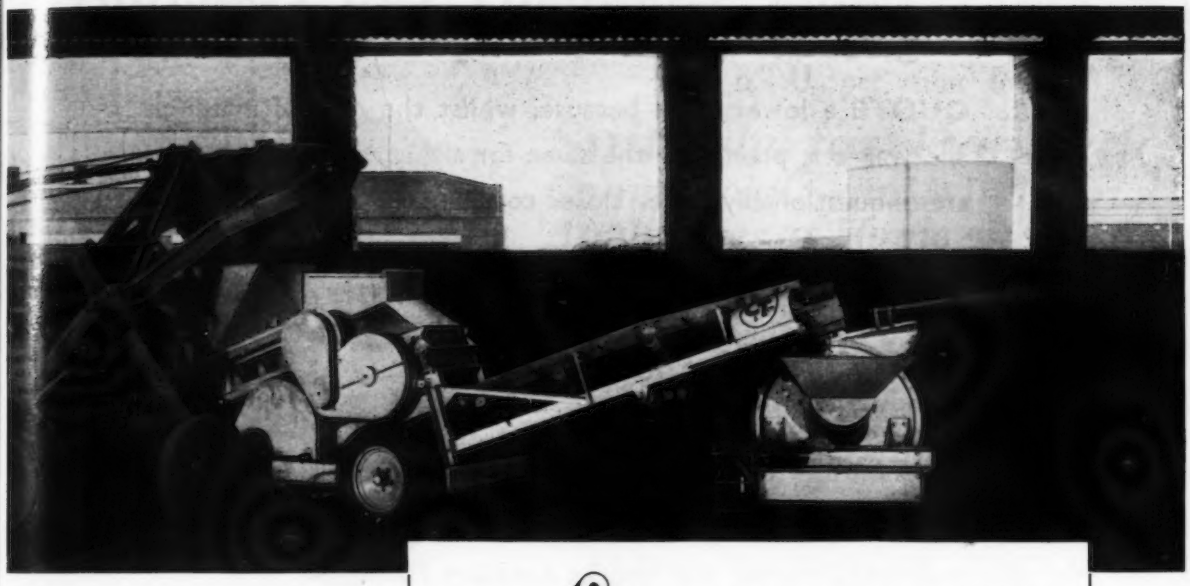
T.A. 427

TWO MEN BREAKING 30 TONS OF OXIDE PER HOUR!



Similar equipment to the above has been supplied to Dumbarton Gas Works

WITH C&T MOBILE EQUIPMENT

FROM 18" CUBE DOWN. The illustration shows C. & T. Mobile Equipment receiving from a mobile shovel oxide in very hard lumps up to 18" cube, and reducing it down to 80% minus $\frac{1}{8}$" size.

This equipment, which has a CAPACITY of 30 TONS PER HOUR, consists of:—

THE C. & T. "BIGRAMPUS" MOBILE CRUSHER/FEEDER which embodies a pre-feed conveyor, a twin-roll crusher that breaks to 6" size and under, and a delivery conveyor.

THE C. & T. 30 TON PER HOUR MOBILE DISINTEGRATOR which disintegrates, aerates and stacks the oxide in one operation.

TWO MEN ONLY are required to achieve this high hourly output, namely the mobile shovel driver and the man who keeps an eye on the two C. & T. machines and hitches them occasionally to the shovel to retract them as the heap of disintegrated oxide grows.

RANGE OF SIZES. C. & T. manufacture Mobile Oxide Breakers with capacities ranging from 2 to 30 tons per hour, and Static Oxide Breakers with capacities of 2 to 80 tons per hour.

Full particulars of this fast operating equipment will be sent on request.

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If you are faced by any bulk conveying or storing problem, please consult us

C&T

Associated with Stokes Castings Ltd.

The Smaller Company can generally

1. **QUOTE** a lower price because, whilst the cost of materials and wages is practically the same for all, its overhead charges are unquestionably under closer control.
2. **GIVE** a better delivery because its erection staff is limited in number and it is therefore a physical impossibility to accept more orders than it can cope with. In other words, it knows its limitations.
3. **GIVE** each contract personal attention.

We submit these important points for the consideration of Engineers sending out their enquiries for Gas Works Ancillary Plant.

PURIFIERS
WASHERS
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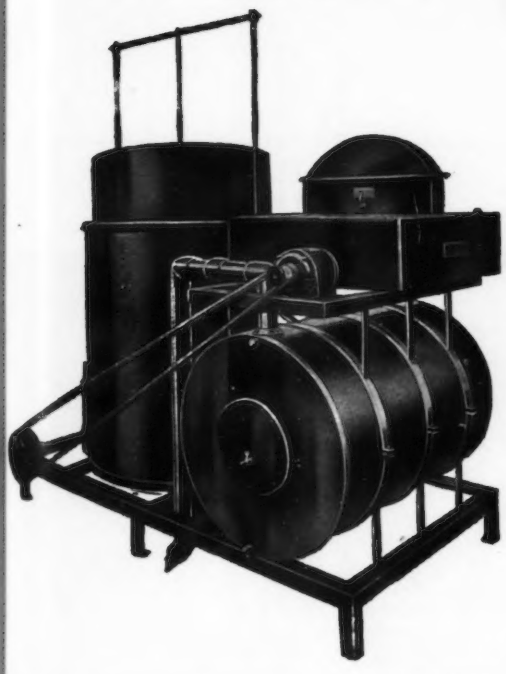

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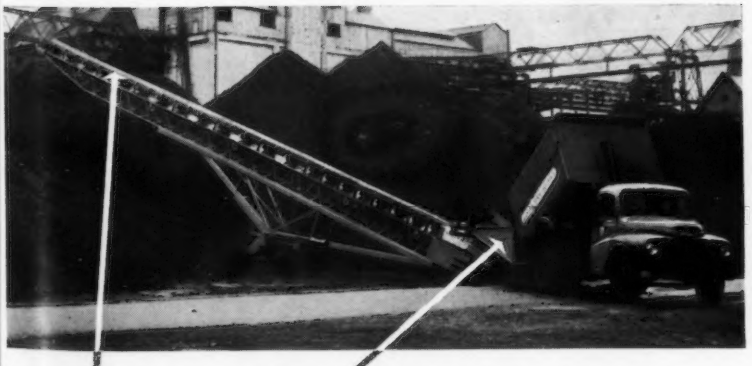

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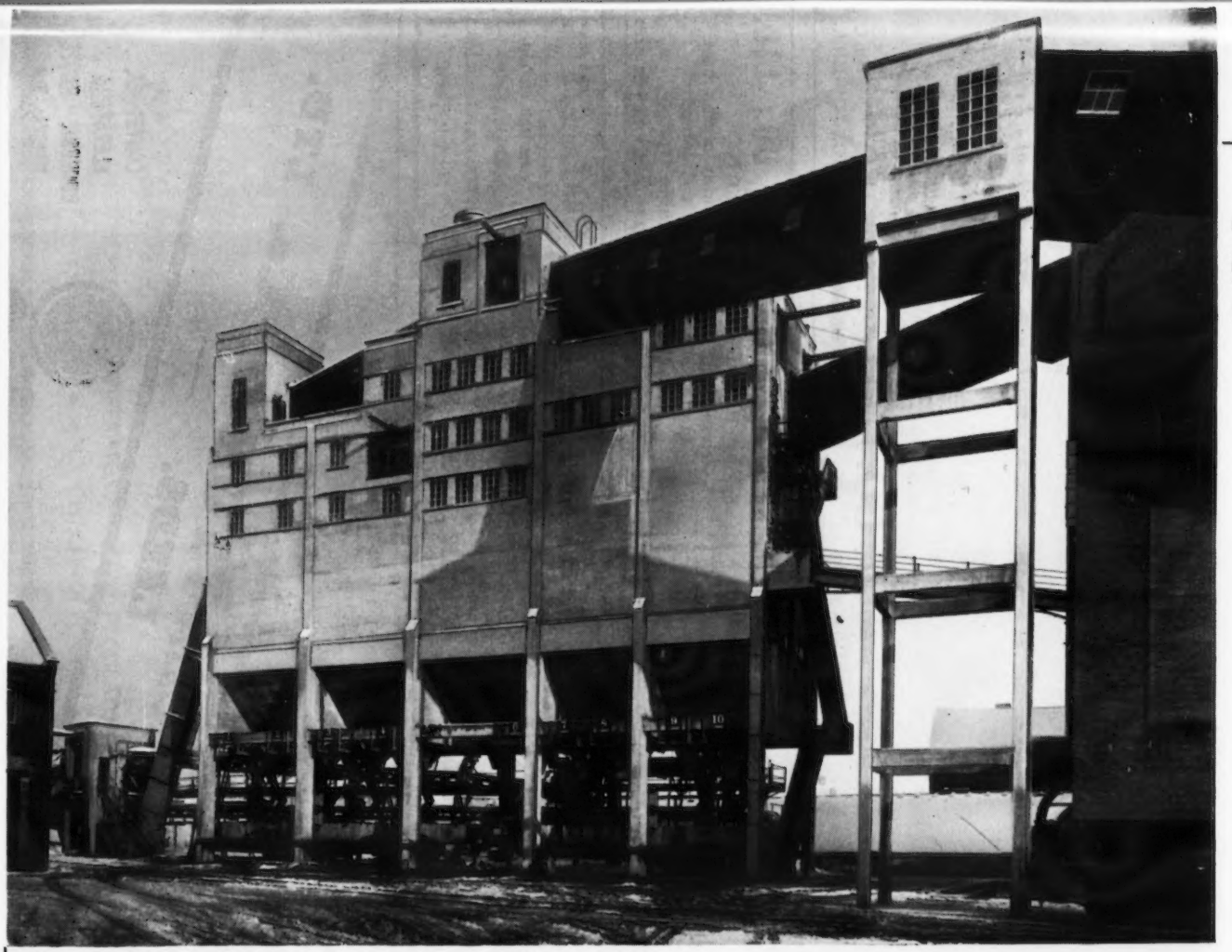

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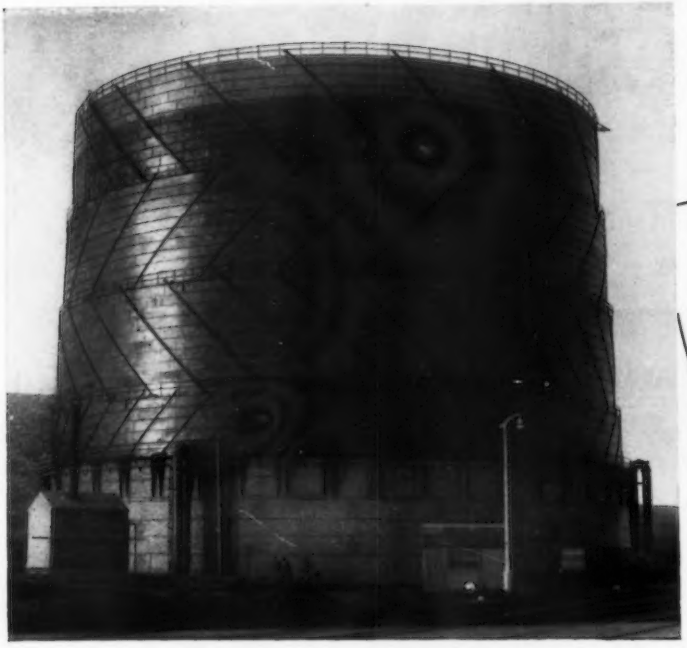

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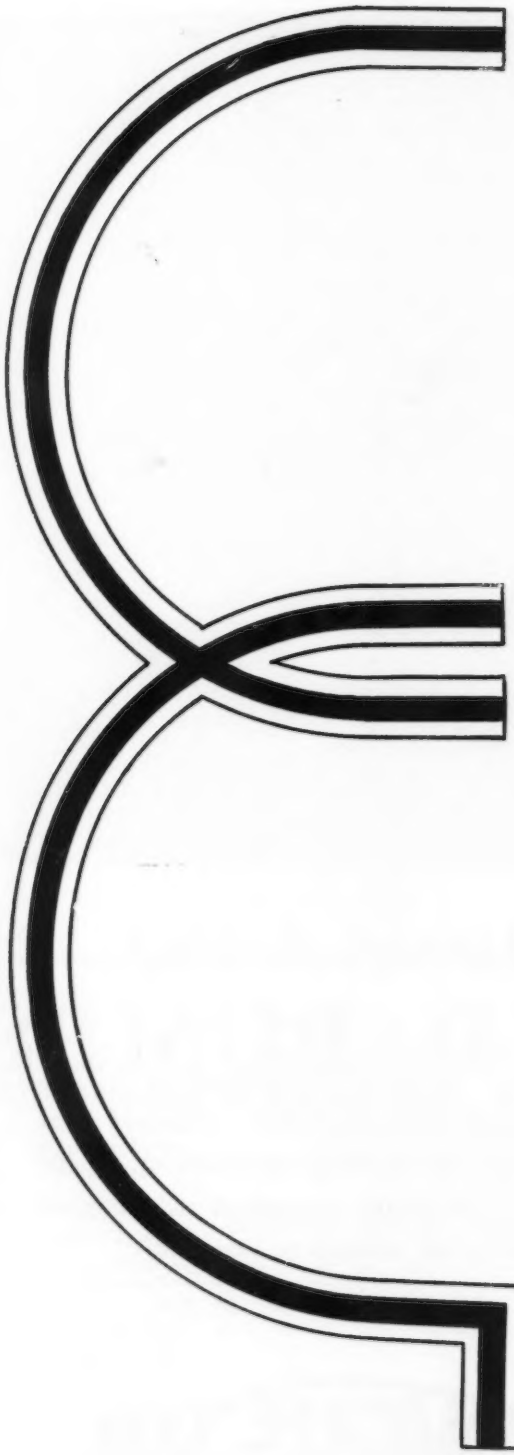

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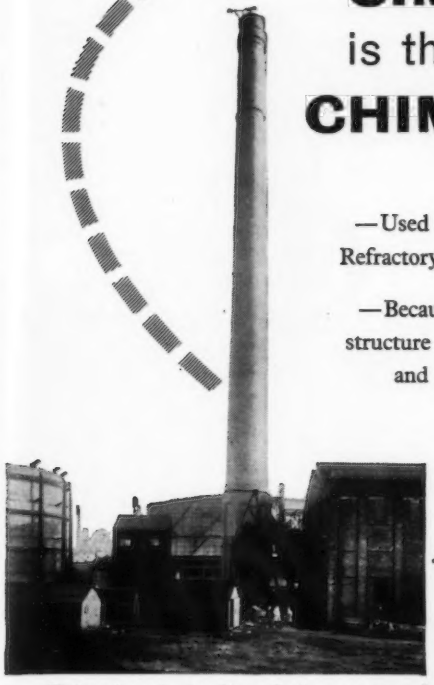

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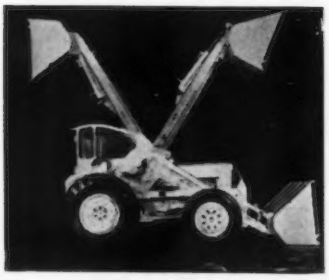

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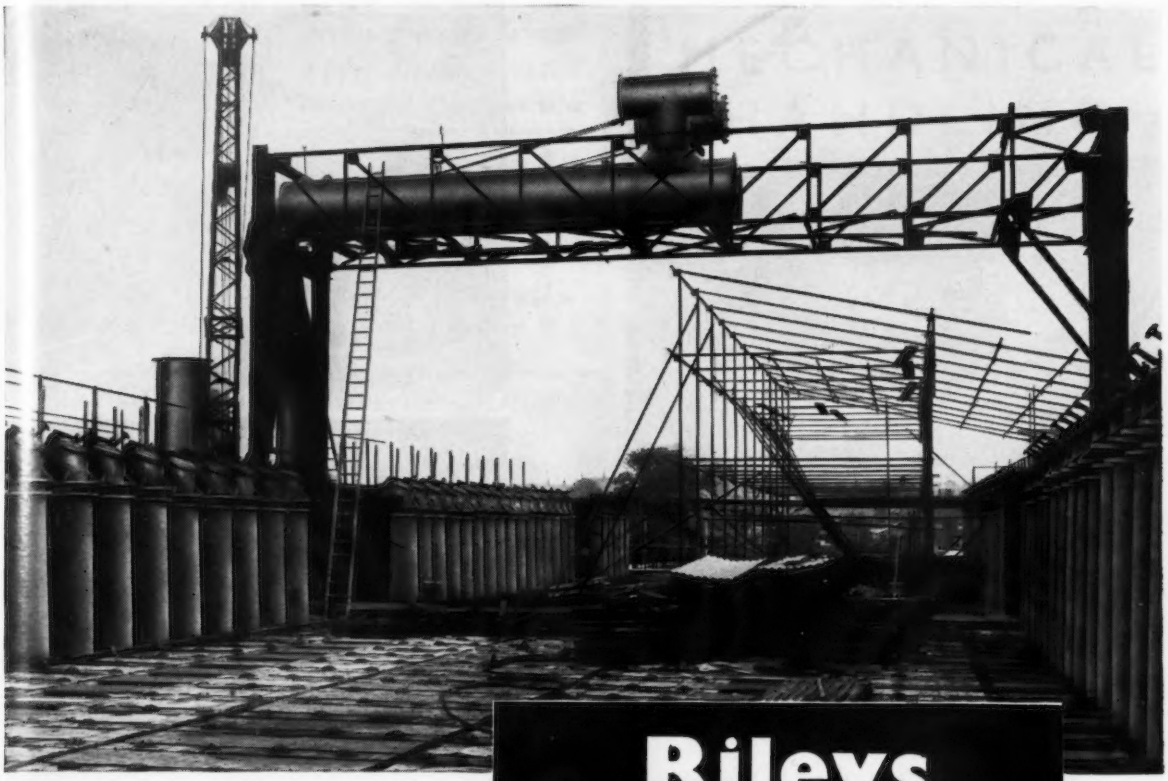

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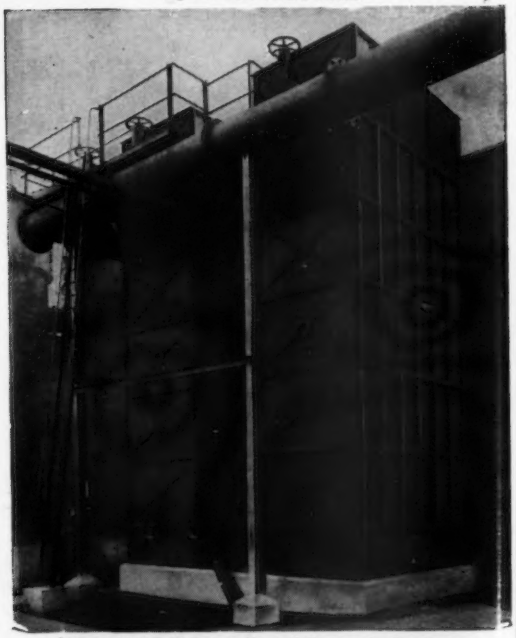

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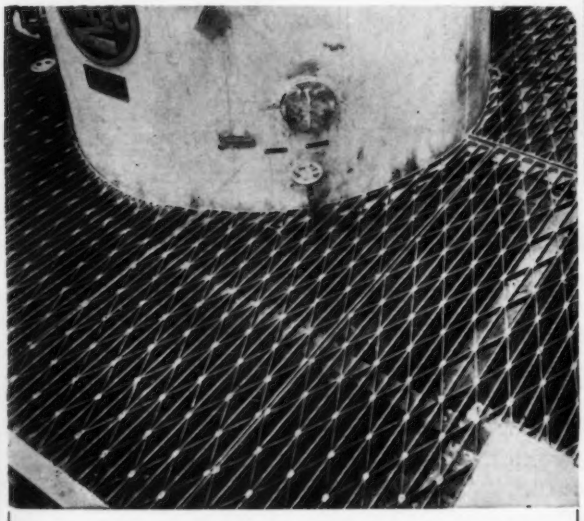

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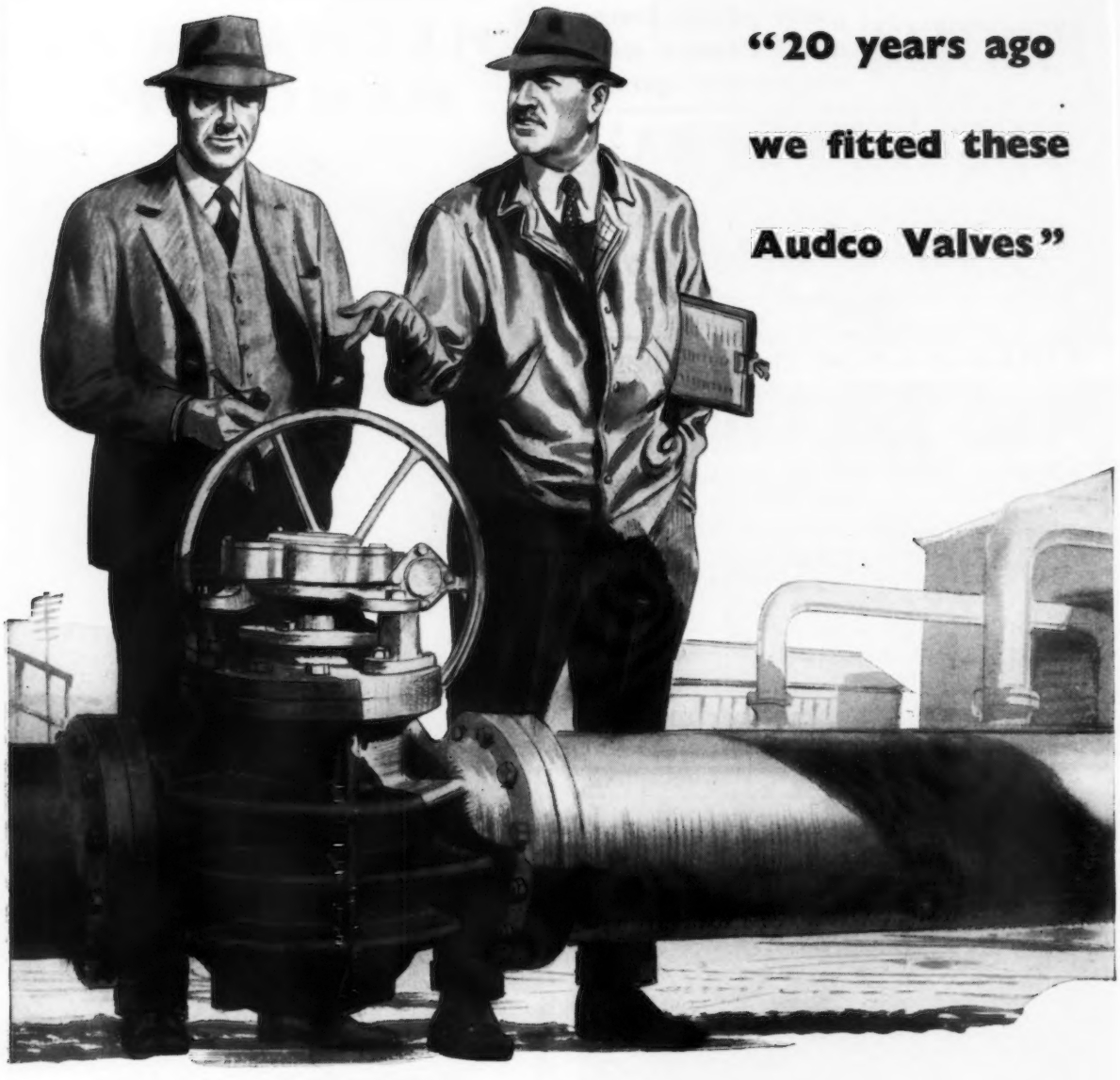

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INDEX TO 'JOURNAL' ADVERTISERS

A — PAGE

A.E.E. Machinery, Ltd. ... ...
Abbott, Birks & Co., Ltd. ... ...
Acme Wringers, Ltd. ... ...
Acrogen Co., Ltd. 557
Autograph Co., Ltd. ... ...
Adler & Mackay, Ltd. ... ...
Aldridge & Ranken Ltd. 567
Allan Taylor (Engineers), Ltd. ... ...
Allen, John & Son (Oxford) Ltd. 542
Alsal, Ltd. ... ...
Ames Gas Water Heaters, Ltd. ... ... Cover IV
Ames Gas Water Heaters, Ltd. (F. A. Neat) ...
Ammore, Benson, Pease & Co. 558
Ashworth & Parker, Ltd. ... ...
Aspinall's (Paints), Ltd. ... ...
Associated Lead Manufacturers, Ltd. ... ...
Associated Lead Manufacturers, Ltd. (Rustodian) ...
Atlas Preservative Co., Ltd. ... ...
Audley Engineering Co., Ltd. 568
Autocontrol Boilers, Ltd. 544
Automatic Telephone & Electric Co., Ltd. ...
Automotive Products, Ltd. ... ...

B

Baie & Church, Ltd. 601
Balfour, Henry, & Co., Ltd. ... ...
Bayley, Thos. (Great Bridge) Ltd. ... ...
Bengwaco Meters, Ltd. ... ...
Benham & Sons, Ltd. ... ...
Blakeley Firth, Sons & Co., Ltd. ... ...
Bolton's Superheater & Pipe Works Ltd. ...
Booth, John, & Sons (Bolton), Ltd. ... ...
Bratt Colbran, Ltd. ... ...
Bray, George, & Co., Ltd. ... ...
Bray, W. E., & Co., Ltd. 564
Bristols Instrument Co., Ltd. ... ...
British Flint & Cerium Manufacturers, Ltd. ...
British Gas Purifying Materials Co. ... ...
British Jeffrey-Diamond, Ltd. ... ...
British Oxygen Co., Ltd. ... ...facing p. 589
British Paints, Ltd. ... ...
British Rototherm Co., Ltd. ... ...
British Thermostat Co., Ltd. ... ...
British Thomson Houston, Ltd. 553
British Tyre & Rubber Co., Ltd. 546
British Vacuum Cleaner & Engineering Co., Ltd. ...
Broadbent, Thomas, & Sons, Ltd. 548
Brockhouse Heater Co., Ltd. ... ...
Broom & Wade, Ltd. ... ...
Brown, J., & Co., Ltd. 560
Bugden, Thos., & Co. ... ...

C

Cambridge Instrument Co., Ltd. ... ...
Cannon (G. A.), Ltd. ... ... Cover I
Cascade Water Coolers, Ltd. ... ...
Cathodic Corrosion Control, Ltd. ... ...
Cementation Co., Ltd. ... ...
Chaseside Engineering Co., Ltd. ... ...
Cinema-Television, Ltd. ... ...
Clapham Bros., Ltd. 566
Clayton, Son & Co., Ltd. 547
Clifford Engineering Co., Ltd. ... ...
Cochrane (Middlesbro') Foundry, Ltd. ... ...
Cohen, George, Sons & Co., Ltd. ... ...
Concrete Proofing Co., Ltd. ... ...
Consolidated Pneumatic Tool Co., Ltd. ... ...
Consett Iron Co., Ltd. ... ...
Crane, Ltd. ... ...
Crone & Taylor, Ltd. 555
Crosby & Co., Ltd. ... ...
Crossley Bros. 550
Crowley Russell, & Co., Ltd. 559
Curtis, A. L., & Co. ... ...
Cutler, Samuel, & Sons, Ltd. 594

D

Davenport Engineering Co., Ltd. ... ...
Davey, Paxman & Co., Ltd. ... ...
Deb Chemical Proprietaries Ltd. ... ...
De la Rue, Thomas, & Co., Ltd. (Gas Group) ...
Dempster, R. & J., Ltd. 541
Dempster, Robert, & Sons, Ltd. 582
Denison & Son, Ltd. ... ...
Derbyshire Silica Firebrick Co., Ltd. 554
Diaphragm & General Leather Co., Ltd. ... ...
Dick, R. & J., Ltd. 548
Donkin (The Bryan) Co., Ltd. ... ... Cover II
Douglas, Wm., & Sons, Ltd. ... ...
Drakes, Ltd. ... ...
Dresser Manufactures (England), Ltd. ... ...
Drew, H. B., Ltd. ... ...
Drummond Patents Ltd. ... ...
Dunlop Rubber Co., Ltd. (Gen. Rubber Goods Division) ... ...

E

E.B. Refractory Cement Co., Ltd. ... ...
Edgar, William, & Son, Ltd. ... ...
Elcontrol, Ltd. 571
Electroflo Meters Co., Ltd. ... ...
Electrolux, Ltd. ... ...
Elliott Bros. (London), Ltd. ... ...
Essard Ltd. ... ...
Esher, Ltd. ... ...
Ewart & Sons Ltd. ... ...
Ewart Chainbelt Co., Ltd. 560
Expanded Metal Co., Ltd. ... ...

F

Fielden Electronics, Ltd. ... ...
Fisher & Ludlow, Ltd. ... ...
Fisher Governor Co., Ltd. ... ...
Flavel, S., & Co., Ltd. 596, 597
Fowler, John, & Co. (Leeds), Ltd. ... ...

PAGE

Franki Compressed Pile Co., Ltd. ... ...
Franklin Furnace Co., Ltd. ... ...
Fry's Metal Foundries, Ltd. ... ...
Fyde & Co., Ltd. ... ...

G

Gas Purification & Chemical, Ltd. 601
General Descaling Co., Ltd. ... ...
General Electric Co., Ltd. ... ...
General Gas Appliances, Ltd. 551
Gibbons Bros., Ltd. 545
Glover, George, & Co., Ltd. ... ...
Glover, Thomas, & Co., Ltd. 572
Godfrey, Sir George, & Partners (Industrial), Ltd. ...
Goodall Clayton & Co., Ltd. 560
Goodyear Mechanical Goods ... ...
Graphite Products, Ltd. ... ...
Green & Boulding, Ltd. 601

H

Hamilton, A. H., & Co., Ltd. ... ...
Hardman & Holden, Ltd. ... ...
Harris & Pearson, Ltd. 602
Harrisons (London), Ltd. ... ...
Harvey, G. A., & Co. (London), Ltd. ... ...
Hattersley & Davidson ... ...
Hayward, E. & Co. (Fabrications) Ltd. 567
Hick Hargreaves & Co., Ltd. ... ...
Hilmor, Ltd. ... ...
Hills (West Bromwich), Ltd. ... ...
Holman, Michell & Co., Ltd. ... ...
Holmes, W. C., & Co., Ltd. 603
Honeywell Brown, Ltd. ... ...
Hopkinsons, Ltd. ... ...
Horseley Bridge & Thomas Piggott, Ltd. ... ...
Horstmann Gear Co., Ltd. ... ...
Howden, James, & Co., Ltd. ... ...
Humphreys & Glasgow, Ltd. 570

I

Ideal Boilers & Radiators, Ltd. ... ...
I.C.I., Ltd. (Metals Division) ... ...
Inertol, Ltd. 560
Ingham, John, & Sons, Ltd. ... ...

J

Jeavons, E. E., & Co., Ltd. ... ...
Jeavons Engineering Co. ... ...
Jenkins, W. J., & Co., Ltd. ... ...
Johnson, C. H. (Machinery), Ltd. 557

K

Keay, E. C & J., Ltd. 542
Keith Blackman, Ltd. 604
Kent, Geo., Ltd. ... ...
Kings Patent Agency, Ltd. ... ...
King, Walter, Ltd. 601
Kirk & Co. (Tubes), Ltd. ... ...
Kirkham Hulett & Chandler, Ltd. 556

L

LaFarge Aluminous Cement Co., Ltd. 563
Laidlaw, R., & Son (Edin.), Ltd. ... ...
Lamont, James H., & Co., Ltd. ... ...
Lancashire Dynamo & Crypto, Ltd. ... ...
Le Bas Tube Co., Ltd. ... ...
Leeds Fireclay Co., Ltd. ... ...
Lionweld, Ltd. ... ...
Lind, Peter, Ltd. ... ...

M

Macpherson, Donald, & Co. Ltd. ... ...
Magnetic Valve Co., Ltd. ... ...
Main, R. & A., Ltd. ... ...
Measurements, Ltd. ... ...
Meltham Silica Fire Brick Co., Ltd. ... ...
Meters, Ltd. ... ...
Metropolitan Leather Co., Ltd. ... ...
Metropolitan Vickers Electrical Co., Ltd. ...
Milnes Meters, Ltd. ... ...
Mint, Birmingham, Ltd. ... ...
Mitchell Engineering, Ltd. ... ...
Mitchell, H., & Co. 550
Moler Products, Ltd. ... ...
Monitor Engineering & Oil Appliances, Ltd. ...
Monk, A., & Co., Ltd. ... ...
Mucklow Bros., Ltd. ... ...

N

National Benzole Co., Ltd. ... ...
National Enamels, Ltd. ... ...
New Conveyor Co., Ltd. ... ...
Newton Chambers & Co., Ltd. ... ...
Norwest Construction Co., Ltd. ... ...
Nu-Swift, Ltd. ... ...

O

Oxley Engineering Co., Ltd. ... ...

P

Parkinson & Cowan (Gas Meters), Ltd. 572
Parkinson Stove Co., Ltd. ... ...
Pass, E., & Co., Ltd. ... ...
Peebles & Co., Ltd. ... ...
Perl Controls, Ltd. ... ...
Power-Gas Corporation, Ltd. 558
Press, William, & Son, Ltd. ... ...
Pulsometer Engineering Co., Ltd. ... ...

R — PAGE

Radiant Heating, Ltd. ... ...
Radiation, Ltd. 580, 581
Rawlplug Co., Ltd. ... ...
Reavell & Co., Ltd. 550
Remington Rand, Ltd. ... ...
Ride & Bell, Ltd. ... ...
Riley, A. J., & Son, Ltd. 565
Roberts, David, & Co. (Engineers) Ltd. ... ...
Roberts, R. E., & Sons, Ltd. ... ...
Robinson, J. H., & Co. (Liverpool), Ltd. ... ...
Rook Bros., Ltd. 601
Royston, Geo., & Sons, Ltd. ... ...
Rozalex Ltd. ... ...
Russell Bros. (Walsall), Ltd. ... ...
Russell, R., & Sons, Ltd. ... ...

S

Salter, T. E., Ltd. ... ...
Senior Economisers, Ltd. ... ...
Shaw & McInnes Ltd. ... ...
Shelton Iron, Steel & Coal Co., Ltd. ... ...
Siebe Gorman & Co., Ltd. ... ...
Sieber, Jas., Equipment Co., Ltd. ... ...
Siemens-Schuckert (Great Britain), Ltd. ...
Sigma Instrument Co., Ltd. ... ...
Simon-Carves, Ltd. ... ...
Simon, Richard, & Sons, Ltd. ... ...
Sisson, W., & Co., Ltd. ... ...
Smith Meters, Ltd. ... ... facing p. 588
Smith, Thos., & Sons (Rodley), Ltd. ... ...
Spencer Bonecourt, Ltd. 547
Sperryn & Co., Ltd. ... ...
Stanton Ironworks Co., Ltd. ... ...
Staveley Iron & Chemical Co., Ltd. ... ...
Steels Eng. Products, Ltd. ... ...
Stein, John G., & Co., Ltd. ... ...
Stelcon (Industrial Floors) Ltd. ... ...
Stewart & Gray, Ltd. ... ...
Stewarts & Lloyds, Ltd. ... ...
Stoves, Ltd. 549
Strachan & Henshaw, Ltd. ... ...
Stringer Bros. ... ...
Sugg, Wm., & Co., Ltd. ... ...
Summerson, Thos., & Sons, Ltd. ... ...
Supra Chemicals & Paints, Ltd. 567
Sutcliffe, R., Ltd. ... ...
Sutcliffe Speakman & Co., Ltd. ... ...
Sutherland, A. G., Ltd. ... ...

T

T & T Works, Ltd. ... ...
Tangyes, Ltd. ... ...
Taylor Bros. ... ...
Thermal Syndicate, Ltd. ... ...
Thomas & Bishop, Ltd. ... ...
Thompson, John, Conveyor Co. 543
Thorp, Thomas, & Co., Ltd. ... ...
Tucker, Eyelet, Geo., Co., Ltd. ... ...
Tully Engineering Co., Ltd. 562
Turners Asbestos Cement Co., Ltd. ... ...

U

Underpressure Engineering Co., Ltd. 560
United Kingdom Construction & Engineering Co., Ltd. ... ...

V

Vaughan, Edgar & Co., Ltd. ... ...
Victaulic Co., Ltd. ... ...
Visco Engineering Co., Ltd. ... ...
Vulcan Stove Co., Ltd. 544

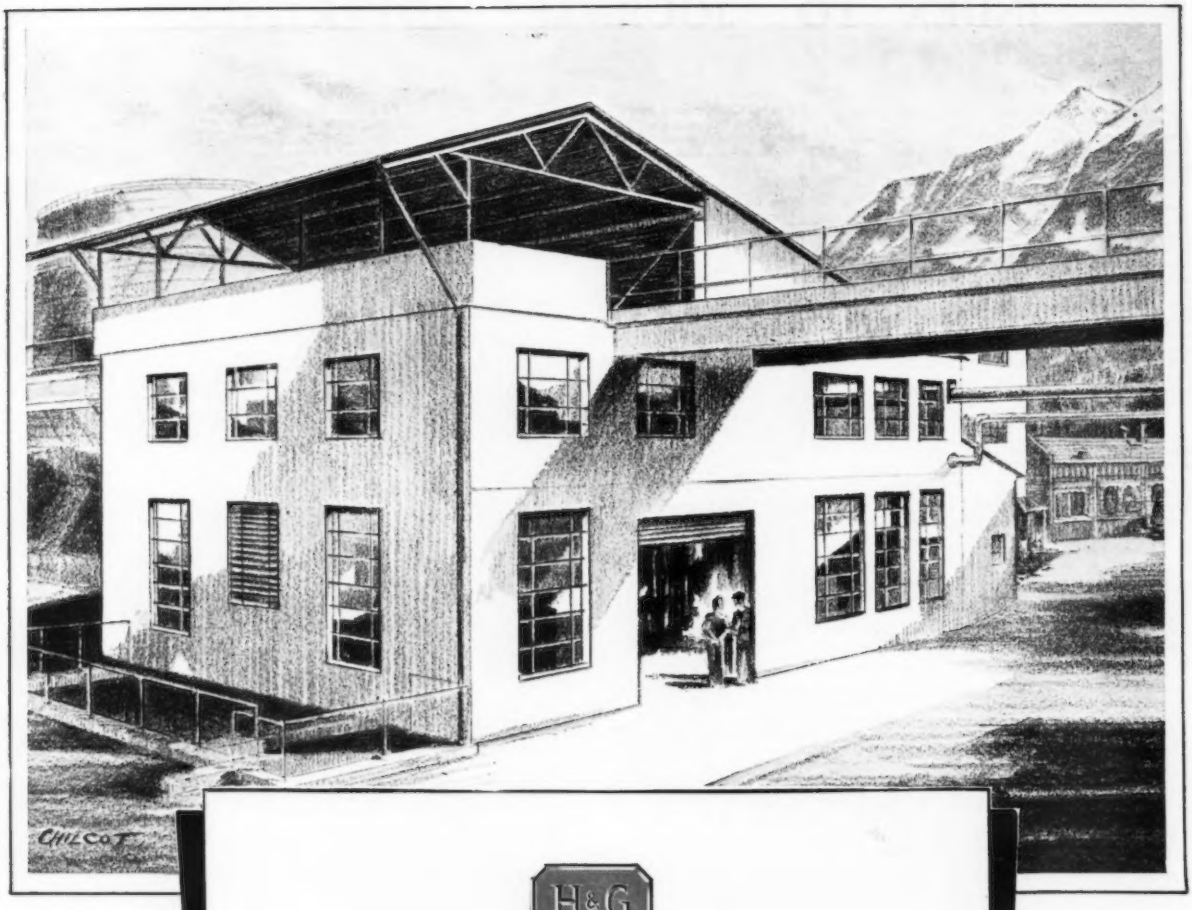
W

Wakelin, F. H., Ltd. ... ...
Walker, C. & W., Ltd. 598
Walker, Crosweller & Co., Ltd. ... ...
Walker, Wm., & Sons (Hanley), Ltd. ... ...
Waller, George, & Sons, Ltd. ... ...
Walter King, Ltd. 601
Ward, Thos. W., Ltd. ... ...
Watson, Robt., & Co., (Constructional Engineers) Ltd ...
Weir, G. & J., Ltd. 561
Wellington Tube Works, Ltd. ... ...
Wellman Smith Owen Engineering Corpn., Ltd. ...
West's Gas Improvement Co., Ltd. ... Cover III
West's Gas Improvement Co., Ltd. (C.O.L.) Division) ... ...
West's Piling & Construction Co. ... ...
Westwood & Wrights, Ltd. ... ...
Whessoe, Ltd. ... ...
Whittaker Hall & Co. (1929), Ltd. ... ...
Wilkes, A. H., & Co., Ltd. ... ...
Willey & Co., Ltd. ... ...
Williams, John E., Ltd. ... ...
Williamson Cliff, Ltd. ... ...
Wilson, George, Gas Meters, Ltd. ... ...
Winn & Coales, Ltd. ... ...
Woodall-Duckham Construction Co., Ltd. ... 579
Wood, Hugh, & Co., Ltd. 552
Wormald Patent Locks Co., Ltd. ... ...

Y

Yorkshire Copper Works, Ltd. ... ...

Agency ... ...
Appointments Vacant 601, 602
Appointment Wanted 602
Contracts Open ... ...
Educational ... ...
Miscellaneous 602
Patents ... ...
Plant For Sale ... ...
Publications ... ...
Repair Work ... ...



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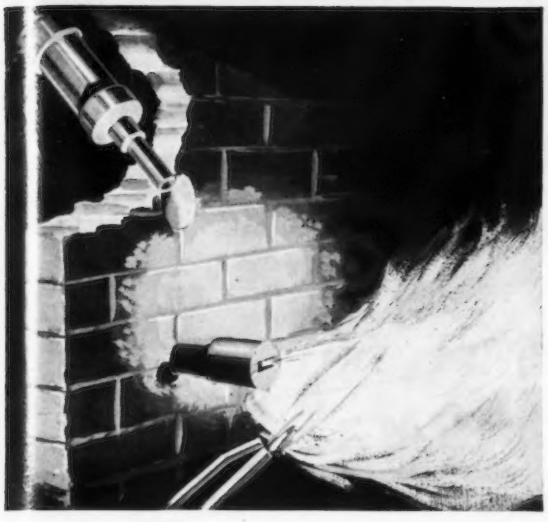

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Gas Journal

VOL. 281 NO. 4787 MARCH 2, 1955

107TH YEAR

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CONTENTS

EDITORIAL COMMENT

Hire Purchase Restrictions .. 573
Atoms and Coal .. 574
Ideal Home, 1955 .. 574
Lebon and Murdoch .. 575

TECHNICAL RECORD

Integration of Gas Supply in Wales. Discussion on paper published in the 'JOURNAL' of February 23 .. 577
Technical Problems in the Utilization of Town Gas in Industry. By F. Dickinson and F. Johnson .. 586
Mechanical Handling of Oxide in Tower Purifiers. Discussion on paper published in the 'JOURNAL' of January 12 .. 591

NEWS OF CURRENT EVENTS

Woodall-Duckham Acquires New Gasmaking Processes 575
Personal .. 576
Obituary .. 576
Diary .. 576
Calendar and Directory Alterations .. 576
Gas Council Chairman Honoured .. 589
Thermo-electric Flame Failure Device .. 590
Royal Visit to Partington Works .. 592
Company News .. 594
Bradford Smokeless Zone .. 594
Week-end School for Gas Staffs .. 595
Severe Test .. 598
Heroism at Waddon Works .. 598
Stanton Development Scheme .. 598
A Smoke Abatement Policy for Scotland .. 599
Gas Council's Ideal Home Preview .. 600

GAS CONSULTATIVE COUNCILS

Old Cookers of No Value .. 600
Standard Charge Too Rigid .. 600

PUBLISHERS' NOTICE, SEE PAGE 601

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Gas Journal

VOLUME 281. No. 4787. MARCH 2, 1955. 107th YEAR

Hire Purchase Restrictions

LESS than eight months after the removal of hire purchase restrictions a new Restriction Order came into operation last Friday, after less than 24 hours warning. It was one of three drastic steps announced in the House of Commons on Thursday; the others were a rise in the Bank Rate from 3½% to 4½%, the highest level for 23 years, and power given to the Exchange Equalization Fund to intervene in transferable sterling markets with a view to discouraging trading in sterling at a discount to the disadvantage of United Kingdom traders and the gold and dollar reserves. The Chancellor described these decisions as 'steps to moderate excessive internal demand and so to match the increase in our imports with a corresponding increase in our exports'.

In the dark post-war years sales of gas appliances were curbed in three ways—by purchase tax, by a ban on promotional publicity, and, for a time, by hire purchase restrictions. Purchase tax still persists, albeit at a slightly reduced rate, the ban on publicity has gone, and for the past eight months area boards have been able to offer attractive deferred payment schemes. With the co-operation of the manufacturers they have been building up sales and thus helping forward the efficient use of fuel and the fulfilment of the aims of the Beaver Report. Now, apparently because hire purchase of luxury goods has got out of bounds, restrictions on practically all such transactions have been reimposed. The old limits were a minimum of one-third of the cash price down and the balance within not more than 18 months. The new restrictions are less onerous, in the sense that the initial payment is limited to 15% of the cash price and the period for payment of the balance is extended to 24 months (and in some cases 48 months), but the Order covers a wider range of goods than that revoked last July, and now includes cookers—previously free of both purchase tax and hire purchase limitations—just when the gas industry is able to show that modern cookers are saving the nation's coal as a result of higher efficiencies.

When water heaters were removed from the list of goods subject to hire purchase restrictions in August, 1953, the Board of Trade said this was part of the Government's measure for improving fuel economy, and the effect on sales was extraordinary. It was officially stated last July, when the old Order was revoked, that 'the Government considers that in today's conditions it is no longer appropriate to control the terms of individual agreements for particular articles, but there is no change in the general limitations of finance for hire purchase'. The *Financial Times* last Friday gave some interesting figures showing increases in sales in 1954 over those in 1953, from which we quote:—

	1954	1953	% Increase
Domestic refrigerators (value)	£546,000	£343,000	59.1
Washing machines (number)	52,750	28,400	85.6
Gas cookers	74,750	65,300	14.2
Electric cookers ...	34,600	19,900	74.4
Gas water heaters ...	37,700	14,800	154.6
Electric immersion heaters	34,000	17,400	94.4

The new Order fixes a minimum of 15% for the initial payment on all hire purchase goods, and the list subject to limitation to 24 months for payment of the balance includes space heaters, excluding appliances (whether or not with provision for gas ignition or electrically operated combustion controls) designed to burn solid fuel only; washing machines and washers, excluding those designed for heating water by electricity or gas but which are not otherwise designed for operation by electricity or gas; and refrigerators up to 12 cu.ft. capacity. The 48 months rule applies to washing machines and washers designed for heating water by electricity or gas but not otherwise designed for operation by electricity or gas, including wash boilers and coppers; cookers, including solid fuel cookers; and water heating appliances, excluding appliances designed to burn solid fuel only. Completely unaffected by the new regulations are coke-burning fires such as the economy grate or the free-standing openable stove. This means that the area boards will be able to co-operate fully with those authorities which are planning the provision of smokeless zones and will continue to make appliances available on very easy-to-pay terms.

Since last summer most area boards have offered terms up to three years for space heaters, water heaters, refrigerators, and other appliances, and up to five years for cookers; and some boards, notably the East Midlands, have accepted £1 down for appliances in the 'popular' class. The sudden imposition of the new restrictions has involved a complete overhaul of the schedules which since July have given such an impetus to appliance sales. We are inclined to agree with the Chancellor that it would be an exaggeration to say that by restricting hire purchase the Government is restrict-

ing the standard of living of the British people. The main effect may well be a slowing down in the expansion of hire purchase rather than a reduction in its absolute level. Our basic criticism is that anything that acts as a deterrent to the acquisition of improved smokeless fuel appliances in these days is not conducive to the best interests of the public.

Atoms and Coal

JUST over a fortnight ago, the Government made statements in both Houses of Parliament concerning its ten-year provisional programme for the development of 'Atoms for Power.' It also issued a White Paper giving the broad outline of the programme to build 12 nuclear power stations in the next ten years at an estimated cost of £300 mill. In response to questions in the House of Commons, Mr. Geoffrey Lloyd, Minister of Fuel and Power, agreed that, in the early years of development, we could not expect a substantial contribution from nuclear power. That was a period during which we expected to get a considerable supplement to our coal resources from the use of oil in power stations which are now going ahead. 'This,' he said, 'is a provisional programme, but at the end of ten years, if all goes well, we should have 12 large nuclear power stations, which should be saving coal to the tune of 5 or 6 mill. tons a year. Looking ahead to the longer period, with all the reservations that are necessary and which are stated in the White Paper, this saving in 20 years' time may be of the order of 40 mill. tons of coal a year. For the first ten-year period the kilowatt output will be 1½ to 2 mill. kilowatts a year and at the end of the second period between 10 and 15 mill. kilowatts a year.'

From the Minister's remarks, one gains a glimpse, a foretaste almost, of the tremendous changes which are going to take place in our fuel and power industries in the years that lie ahead—and it should be noted, not so very far ahead. In a number of ways, the coal shortage in this country since the war has forced the pace of developments in the application of nuclear power to the production of electricity, for it has become increasingly apparent that coal output is likely to continue to lag behind growing requirements unless some other factor can help to redress the balance. This nuclear power may well be doing before the next decade or two have passed.

Since atomic engineering is in its very early stages, it is quite on the cards that some new development or increase in efficiency in the existing heat exchange processes, may add materially to the electrical output of the nuclear power stations in view. On the other hand, a totally new process may be discovered by means of which freed electrons could be harnessed directly, completely eliminating the heat cycle. This, of course, would transform the situation and herald the age of really cheap and abundant power. Much has been discovered about nuclear power during the last ten years and it is not unreasonable to suppose that the next decade will open an ever-expanding field of research and development. As the years go by so more and more knowledge is acquired and from the increasing fund of this knowledge, more secrets will be unlocked. Coming back to earth again, however, the immediate prospect is that in ten years electricity equivalent to about 5 mill. tons of coal will be produced at nuclear power stations and, furthermore, will be produced at a cost competitive with that of electricity from conventional power stations. If coal continues to rise in price, as appears likely, and if electricity from nuclear stations becomes cheaper and cheaper as it may well do as the technique of operating new stations becomes more fully understood, then it will not be very long before electricity from coal-fired plants will become a thing of the past.

And what does all this mean to the gas industry? Unfortunately it does not mean that there will be much larger quantities of coal available to the carbonizing industries in the very near future. Whatever coal is saved in the first years of operation of nuclear stations will go to reduce our imports of coal. Until these are completely wiped out and indeed replaced by substantial export quantities, it is not likely that there will be much more for domestic markets. Recent pronouncements of the Chancellor of the Exchequer have shown that the high rate of our imports as compared with our exports is concerning him, and it is certain that any extra coal that we could sell abroad would be a great help to our balance of payments.

It should be noted that Mr. Lloyd drew attention to the importance of oil in tiding our power stations over the years intervening between the present and the advent of the nuclear stations. Presumably, when these stations take over, certain quantities of oil will become available to other industries, and on this basis, it would seem that the gas industry is wise to take oil gasification as seriously as it is doing. Clearly, if the cost of coal continues to rise and the price of electricity should start to fall, the gas industry will have to exert its ingenuity to the utmost to compete with electricity in a number of fields. Even if the right type of coal becomes plentiful to the carbonizing industries, unless its price is also right, gas will be at a disadvantage *vis-à-vis* electricity. Changes such as those envisaged by the introduction of nuclear power may well announce a new industrial revolution and a flood of new ideas. We must ensure that the gas industry rides on the crest of the wave.

Ideal Home, 1955

YEAR by year the sponsors of the Ideal Home Exhibition rack their brains to devise new attractions, but it is an interesting thought that, by and large, the special features each year mirror the subjects which are most occupying public attention. For example, take the fare offered by the 1955 edition which opened its doors to Her Majesty the Queen and the ladies and gentlemen of the Press on Monday, and to the hungry hordes yesterday. The principal exhibits include a Do-it-Yourself section, a Television Feature, a Nylon Fair, and a Street of Better Living (a cheering sign this!). Permanent joys are represented by houses, weddings, gardens, food, and, of course, kitchens. Which is our cue for mentioning the fuel industries. As in previous years gas and electricity hold court in the Grand Hall, the Gas Council and the E.D.A. like mother hens each surrounded by their chicks.

A peep at the family on the gas side revealed 12 lusty children—one more than on the electric side. And what a fine show they provide! Any doubters who cling to the fallacy that gas is on the way out will have to revise their ideas after taking a look at the exhibits. For here are new ideas expertly presented, new appliances with new features, new evidence of the industry's conviction that its full glory is yet to come in a vital contribution towards making the air of Britain clean and pure. Oddly enough, the emphasis this year is not on cookers but on gas-electric washing machines, water heaters, refrigerators, and space heaters, in all of which fields there are welcome and impressive newcomers.

Next week we shall be devoting space to a full review of these stands and the appliances they feature. But in these introductory comments we must not fail to mention the contribution made to the gas cause at Olympia by the Gas Council. In their theme 'The Happy Home' they have a winner, the more so because the exhibit is linked with a home-making manual of the same name which the Council has prepared in collaboration with Good Housekeeping—the fourth healthy child of what we might term this marriage of professional convenience. The book, publication of which coincides with the Ideal Home, is one of those colourful encyclopedias of household knowledge for which this publishing house is justly famous, but throughout the emphasis is so firmly on gas that it just has to be seen to be believed. When one considers the probable distribution of such a volume, the publicity value is enormous. Under the cloak of Good Housekeeping the gas message will circulate in a manner that would be wholly impossible for purely gas propaganda. The Council's stand has as its key points of interest three different full-scale kitchens suitable for households of different sizes. Emphasis is on colour, not only in the kitchens but elsewhere on the stand. Indeed, our most striking recollection is of the ingenious and tasteful colour schemes, and the neat and effective use of expanded metal and wire on some of the display panels. This is a more integrated stand than its chief rival across the aisle, but of the respective merits of the gas and electric stands we shall have more to say next week.

It must not be thought, however, that gas at the Ideal Home is confined to the gas section. Far from it. Gas is magnificently represented in the 'Village on the Hill' the six houses, two bungalows and block of flats, which this year comprise the 1955 housing exhibits. The fact that gas appliances predominate in these structures is not likely to be missed by the tramping, footsore, but ever watchful housewives. In addition, gas has been chosen for the Ideal Kitchen, designed by the Council of Scientific Management in the Home.

LEBON AND MURDOCH

WHILE we have been celebrating the bicentenary of the birth of Murdoch, our French friends have commemorated the 150th anniversary of the death of Phillippe Lebon. 'Each of them,' writes the Editor of *Chimie et Industrie* in his January issue, 'is considered in his own country as the pioneer of the gas industry, while each is ignored on the other side of the Channel.' The editorial sets out the historical facts of the origin of coal gas in a concise and scrupulously fair story. It began before the birth of Murdoch. In 1680, Johann Joachim Beeher had distilled coal to obtain coke and tar and had lighted the accompanying gas. In 1691, Robert Boyle had observed the evolution of a combustible gas when coal was heated. John Clayton in 1739 had prepared coal gas, George Dixon in 1779 and Lord Dundonald in 1786 had lighted their respective houses with it and Professor Pickel of Wurtzburg his laboratory, while Jean-Pierre Minckelers had used it some years after to fill baloons.

Our contemporary relates the story of Murdoch ('the incomparable mechanic'), who not only developed coal gas manufacture and utilization for the first time on a practical scale, but who also contributed largely to the development of the steam engine and mechanical devices of several kinds under the direction of Boulton and Watt. The subsequent work of Samuel Clegg in the purification of coal gas to fit it for internal use, and that of Frederick Albert Winsor ('ignorant, but imaginative and eloquent') in its popularization and the foundation of the first commercial enterprise in the gas industry, are recounted.

Lebon's patents date from 1798 and 1799. His 'thermolampe' was a small gasworks for domestic use. It consisted of a retort filled with pieces of wood placed in a furnace. The gas was washed and led to a small water-sealed gasholder whence pipes conducted it to the lamps. The Napoleonic Government was more interested in his production from the distillation of wood of tar for the navy. His death in 1804 is veiled in some obscurity. His widow endeavoured to continue his work.

WOODALL-DUCKHAM ACQUIRES NEW GASMAKING PROCESSES

In view of the present shortage of coal suitable for carbonization, the Woodall-Duckham Construction Co., Ltd., decided early last year to investigate gasmaking processes based on oil which might be of great importance to the British gas industry in maintaining supplies of gas, as well as in liberating smokeless fuel for the domestic and other markets. Members of the Woodall-Duckham technical staff, together with the Company's consultant, Dr. H. Hollings, have inspected plants in routine operation in the United States in order to assess the suitability of various processes and plants. As the result the Company has acquired the following exclusive licences covering territories in which it operates:—

(a) From the Gas Machinery Company of Cleveland, Ohio—oil gas processes and plants including the Hall process of the American Gas Association.
(b) From Koppers Company, Inc., of Pittsburgh, Pennsylvania—gas reforming plant incorporating the Koppers-Hasche process.

Before the examination of processes and plants the Company concluded that to meet its assessment of the requirements of the British gas industry the new processes which it might acquire should conform to the following essentials:—

The process, or combination of processes, should be capable of using as gasmaking materials a wide range of liquid and gaseous hydrocarbon feedstocks; the plants should be suitable for construction in large units having no undesirable limitation upon their capacity; the processes must have passed through the development stage and be suitable for immediate installation on a commercial scale; it was preferable that catalyst material should not be employed; the plants should be low in capital cost; have a high efficiency; and be suitable for continuous or intermittent operation with complete safety and convenience. The new processes which Woodall-Duckham has acquired conform to these requirements.

The Woodall-Duckham Construction Co., Ltd., has received an order to build a high B.Th.U. oil gas installation incorporating the Hall process of the American Gas Association at Gloucester for the South Western Gas Board. When this plant is in routine operation trials will be carried out with various feedstocks so that the gas industry may have first-hand information covering the yields to be obtained from the various hydrocarbon feedstocks available in this country.

Descriptions of the processes and plants will appear in later issues of the 'JOURNAL.'

Personal

MR. F. G. SYMON, A.M.I.MECH.E., M.INST.GAS E., General Manager of the Central Division of the Southern Gas Board, has also taken over the management of the Northern Division as from March 1. This appointment arises in consequence of the death in January of Mr. Alexander Tran, who was General Manager of the Northern Division.

MR. P. P. MACDIARMID has been appointed Chairman of Willey & Co., Ltd., the Vulcan Stove Co., Ltd., the Sutherland Meter Co., Ltd., and Nicholls & Lewis, Ltd., and has also been appointed to the Board of Redheugh-Willey, Ltd. Mr. MacDiarmid will continue to act as Chairman of the Dowson & Mason Gas Plant Co., Ltd., of Manchester.

MR. J. S. GERRARD has now joined Metal and Pipeline Endurance, Ltd., as Senior Engineer in charge of corrosion mitigation schemes. Mr. Gerrard since 1949 and until recently was on the staff in Kuwait of the Kuwait Oil Company as corrosion engineer for supervision of the anti-corrosion activities carried out by that Company. Among others, this included cathodic protection of jetties, submarine lines, underground lines of all sizes, water tanks, marine craft, and internal cathodic protection of water lines.

MR. H. H. SMITH, Assistant Manager of the special vessels department of Babcock & Wilcox, Ltd., has been appointed Sales Manager of Edwin Danks & Co. (Oldbury), Ltd. A native of Yorkshire, Mr. Smith was educated at Brighouse and at Halifax Technical College. Following experience in boiler manufacture with a Yorkshire firm, he joined the estimating department of Edwin Danks & Co., Ltd., and was transferred in 1938 to the comparatively newly-formed special vessels department of Babcock & Wilcox, Ltd., being appointed Assistant Manager of the department in 1950.

Obituary

MR. W. EAMES CATON, M.I.C.E., M.I.MECH.E., M.INST.GAS E., who retired in 1929 as Managing Director and Chief Engineer of the Oxford and District Gas Company, has died at his home at Bournemouth. Mr. Caton commenced his association with the gas industry when he became an articled pupil, in 1896, to the late Mr. W. R. Phillips, Engineer, Manager, and Secretary of the Luton Gas Company, and a number of other gas and water companies. He remained with Mr. Phillips for over five years, when he obtained the position of Assistant Gas Engineer to the Midland Railway Company, under Mr. Henry Fowler (later Sir Henry Fowler). After serving the Railway Company for three years, he obtained the position of Assistant Engineer and Manager to the Derby Gas Company under Mr. J. Ferguson Bell (later Sir John Ferguson Bell), and after about five years he was promoted to the position of Deputy Engineer and Manager. After serving the Derby Gas Company for nearly 12 years, he obtained, in 1916, the position as General Manager and Engineer of the Oxford Company He was President of the Midland Juniors in 1907-08, and of the Midland Association of Gas Engineers and Managers in 1925-26. He was elected an Associate Member of the Institution of Mechanical Engineers in 1910, and later transferred to the class of Member. He was elected a Member of the Institution of Civil Engineers in 1927. In 1929, Mr. Caton delivered to the annual general meeting of the Institution of Gas Engineers his communication 'Construction of Complete New Gasworks at Oxford, with Costs and Working Results over 18 Months.' He retired that same year from his position with the Oxford Company, to be succeeded by the late Mr. Alexander Tran, who died this year. For a time, Mr. Caton continued as a consultant engineer to the Oxford Company.

Calendar & Directory

ALTERATIONS

THE following changes have been notified during the past month. To keep the information in the current 1955 edition of the GAS JOURNAL CALENDAR AND DIRECTORY up to date readers are invited to note these alterations in the Directory section.

Page D24.—WALES G.C.C.: Sir George Hamer, C.B.E., J.P., *Chairman.*

Page D45.—NORTH EASTERN: Delete A. Higgs, *Industrial Engineer.*

Page D51.—NORTH THAMES: J. M. Grammer, *Controller of Services,* vice W. S. Gooch, retired. *Controller of Stores* now reads *Controller of Supplies.*

Page D57.—NORTH THAMES: Delete A. F. Hetherington, *Divisional Manager.*

Page D69.—NORTHERN: (As from May 1, 1955) J. E. White, *Deputy Chairman,* vice J. R. Bradshaw, retired.

Page D71.—TYNESIDE: (As from May 1.) Delete J. E. White, *General Manager.*

Page D83.—SOUTH WESTERN: W. J. Baker, M.B.E., Member. (This appointment had effect from September 1, 1954.)

Page D89.—SOUTHERN: Add A. F. Hetherington, *Commercial Manager.*

Page D93.—WALES: Sir George Hamer, C.B.E., J.P. (Chairman of Consultative Council) *ex officio Member.*

Page D106.—WALSALL AND DISTRICT: F. Harvey, *Divisional General Manager,* vice E. Hardiker, retired.

Diary

March 4.—LONDON JUNIORS: Short Paper Night. 'Bog Ore,' H. C. Walker; 'A Cubic Mile,' J. C. Salmon; 'Was Mrs. Beeton Right?', Miss J. Houghton. 178, Edgware Road, London, W.2. 6.30 p.m.

March 5.—MANCHESTER JUNIORS: Visit to Partington works.

March 5.—SCOTTISH JUNIORS: JOINT MEETING OF WESTERN AND EASTERN DISTRICTS: Address by H. F. H. Jones, M.B.E., Deputy Chairman, Gas Council. Glasgow, 3 p.m.

March 7. — NORTHERN G.C.C.: Gas Board Offices, 30, Grainger Street, Newcastle, 11.15 a.m.

March 8.—MIDLAND JUNIORS: 'Gas Quality Measurement,' H. Mellors. Birmingham.

March 8.—SCOTTISH JUNIORS (EASTERN): Jubilee Dinner. Adam Suite, George Hotel, Edinburgh.

March 9.—SOUTH WESTERN SECTION, I.G.E.: General Meeting. Tour of Swindon works of British Railways, preceded by talk on the building of locomotives.

March 12.—YORKSHIRE JUNIORS: Short Paper Day. 'Benzole Production,' T. Clegg; 'Iron Bacteria in Gasholder Water,' A. R. Mitchell; 'Appliance Reconditioning,' W. Voce. Wakefield.

March 12.—NORTH OF ENGLAND SECTION, I.G.E., and COKE OVEN MANAGERS' ASSOCIATION: Joint Visit to Howdon Gasworks, 2.30 p.m.

March 15.—LONDON AND SOUTHERN SECTION, I.G.E.: 'Distortion of Carbonizing Plant by Heat,' G. Dougill. 17, Grosvenor Crescent, S.W.1, 2.40 p.m.

March 16.—SCOTTISH JUNIORS (WESTERN): Visit to R. & A. Main Ltd., Falkirk.

March 16.—LONDON JUNIORS: Visit to the Meteorological Office at Dunstable.

March 16.—EASTERN JUNIORS: Industrial Controls,' by a representative of Perl Controls, Ltd. Lowestoft.

March 17.—MIDLAND JUNIORS: Visit to Stafford Gasworks.

March 19.—WALES AND MON. JUNIORS (SOUTH): Joint Meeting with Western Juniors. Address by Mr. Gerald Nabarro, M.P. Cardiff.

March 22.—MIDLAND JUNIORS: 'Purification,' F. Grocott, Birmingham. 6.30 p.m.

March 25.—MANCHESTER AND NORTH OF ENGLAND SECTIONS, I.G.E.: Joint visit to Tingley Gasworks, followed by Centenary Dinner of Robert Dempster & Sons, Ltd., Elland, at Queen's Hotel, Leeds.

INTEGRATION OF GAS SUPPLY IN WALES

The paper which E. M. Edwards (Member), S. L. Wright (Gas Engineer), W. T. Hird (Distribution Engineer), and T. S. Ricketts (South Wales Grid Manager), all of the Wales Gas Board, gave to the Institute of Fuel in London on February 10, provoked a lively and constructive discussion. The paper was published in the 'JOURNAL' of February 23 (pp. 510-523).

THE PRESIDENT (Dr. W. Idris Jones), in introducing the authors, said the paper brought out the necessity to utilize all forms of energy, wherever they were located and in whichever form they appeared—hydro energy, gaseous energy, oil, solid, or any other form of energy.

Mr. W. R. Branson (Deputy Chairman, West Midlands Gas Board) said he appreciated Mr. Edwards' kind reference to the fact that his father had negotiated the first coke oven in Wales —and, he believed, in Britain—in 1907. He paid tribute to the Wales Gas Board and particularly to the authors for their imagination and enterprise in providing solutions to the difficult and complex problems of gas supply in their area. Probably no other area board was so rich in potential sources of gas as the Wales Board; it might almost be said to suffer from an embarrassment of riches. Certainly the multiplicity of possible external sources of gas was a factor which made forward planning very difficult. To most people, the estimation of future requirements was a sufficient exercise in crystal gazing. In Wales, when one considered the list of possible sources of gas listed in the paper, it was evident that a soothsayer should be on the permanent staff. Everyone would be in agreement with the paper's main theme of the need to ensure the best use of all available fuel resources. From this it seemed to follow naturally that refined gases of high calorific value should not be put to uses for which low grade and cruder fuels could be used if any economic alternative could be found.

Use of Petroleum Fuels

The authors had referred to the possible use of a number of petroleum fuels as sources of gas supply; and, though no figures were mentioned, the potential availability of such fuels, particularly if the use of crude oil was contemplated, must be very considerable. How far the gas industry should increase its utilization of petroleum products was, at the present time, a matter open to considerable argument. In the short term and in view of the great difficulty in obtaining adequate supplies of good gas-making coals, there was little alternative if expansion of gas production was to continue.

In the long term, it might be that atomic energy would lessen the pressure on home coal supplies. Increasing world demand for oil, arising from industrialization and mechanization of transport in the undeveloped countries of the world, might raise the price of oil. The result might be to bring a return to the relative prices of coal and oil which existed prior to the last war, or at least to some movement in that direction. Such long-term considerations might be of relatively minor importance in designing a grid system within an area such as South Wales, since the grid was no doubt sufficiently flexible to permit of it being supplied with gas from various sources at any one of a number of points throughout its length. Moreover, the capital costs of plant for the gasification of oil were likely to be relatively low. If, however, consideration was to be given to the development of inter-area grid mains for the transmission of large quantities of gas, it was important, since the life of such mains might be 50 years or more, that they should continue to serve a useful purpose for that time.

Oil Gasification

The work of the West Midlands Research Station of the Gas Council on gasification had recently been extended to include the gasification of oil. Nevertheless, his view was that the development of processes for the gasification of coal, which would render the industry less dependent on the caking power and low ash content of its coal supplies, must be retained as the principal aim of this research programme. The authors had, he continued, compared the pattern of industrial development and consumer demand in South Wales with conditions in Germany and Belgium. Certainly, there were strong points of resemblance between the Ruhr and the industrial belt between Newport and Llanelly. The areas were comparable in size, but coal production in the Ruhr reached 140 mill. tons in 1943, as compared with a deep-mined production in South Wales of 23¾ mill. tons in 1953. Of the Ruhr production in 1943, nearly 40% was coked, as compared with only 16% in South Wales in 1953. As a consequence, the incentive to finding profitable outlets for coke oven gas in the Ruhr was, therefore, even greater than in South Wales and led, before the war, to the development of the use of coke oven gas as a raw material in the manufacture of fertilizers, liquid fuels and other chemicals, as well as the transmission of gas to other parts of Germany. The extraordinary degree of integration between the coal, coke oven, steel, and chemical industries in the Ruhr which had developed by the end of the last war was a more striking feature of the fuel economy of that area than the development of long-distance gas transmission. In spite of the great lengths of grid main in Western Germany, the quantities of gas transmitted more than 50 miles outside the Ruhr area were small in relation to the total production.

The foregoing should not be taken as indicating opposition to any proposals for inter-area supplies of gas in Britain. Clearly, every case had to be examined on its merits. Since nationalisation, each area board had been engaged on the integration of its own area, and, as this work approached completion, the time was becoming ripe for the consideration now being given by the Gas Council to the subject of inter-area supplies.

He commented on the failure of domestic demand for gas in South Wales to develop as had been hoped. This failure was not confined to Wales and had been a feature of annual reports of area boards for some time. A solution to this problem was urgent in view of the heavy capital expenditure in which the industry was involved as a result of the post-war housing programme. More promotional tariffs might be the key to the matter, but their introduction had been made difficult by the rapidly rising costs of labour and materials. He might be treading on dangerous ground, he suggested, in hinting that the Wales Gas Board would be performing a service to themselves, to the miners of South Wales and to the nation if they could persuade all concerned that the 734,000 tons of miners' coal supplied in 1953 might be replaced by gas.

Mr. E. M. Edwards said he thought he could agree with practically everything Mr. Branson had said, certainly on the question of integrated mains. Anyone spending money on something which was to last for 50 years must have a reasonable assurance that the mains would be able to remain in operation and that the raw materials would be available. The question of domestic demands for gas was fundamentally a question of the price of gas and the tariffs which were put forward. Certain forms of tariffs which they had recently introduced did not go as far as his Board would have liked to go, but they were hoping, as their schemes developed, to be able to apply their energies to the introduction of more suitable domestic tariffs. Price and service were important factors. He agreed with Mr. Branson on the subject of miners' coal. His Board had tried to deal with this but had not yet been successful.

Mr. W. K. Tate (President, Institution of Gas Engineers) underlined one or two of the lessons which could be drawn. The first was the extent to which the Wales Gas Board had explored the various sources of fuel and of gas that were

available; it had gone into the subject, he thought, more than any other gas board in the country. The fact that it had unusual opportunities for doing so in no way detracted from its devotion to the principle that the best use must be made of the nation's fuels. Wonderful co-operation had been evidenced by all concerned in the various projects. The Board had to co-operate with the National Coal Board, with the steel makers with their coke ovens, with the independent coke oven people, and with the oil company at Llandarcy, and there had been tremendous co-operation with local authorities, county councils, and so on, with the grid mains running so rapidly over the country. Congratulation was due to all these bodies for the way in which they had appreciated the problem of using fuel resources in the best way.

From the paper, one could reasonably be sure that gas supplies in both South Wales and North Wales were assured for a long time, but he was concerned about the position regarding coke. He knew nothing about South Wales, but he was astonished at the low sale of coke to domestic consumers. He knew that there was free or cheap coal for certain sections of the community but presumably smokeless zones would be introduced in the larger cities and he wondered where all the coke was to come from and whether the Wales Gas Board had, in fact, decided that it was no longer a two-fuel industry.

Beaver Report

The gas industry, perhaps, had tended to move a little towards gas at the expense of coke, but the implementation and success of the Beaver Report—which had galvanized the highest authorities in the land into some form of action—would depend on greatly increased quantities of solid smokeless fuel. He asked how this problem was to be met and whether the Wales Board would treat it rather in the way that the South of England appeared to be doing, which from the consumer's point of view, at least, was probably right. There was a statutory obligation to provide gas and no similar statutory obligation to supply coke, but if people wanted coke, there was a duty to provide them with it. Even more was it the duty of the gas industry to provide it if the use of coke was encouraged, if not demanded, by legislation.

In his own part of Southern England, due to the incidence of rather peculiar factors, there was a great deficit in the supplies of coke manufactured by the gas board, and therefore vast quantities were imported, at no small cost, from the rest of England. So far they had not tried Wales, but it was certainly nearer than Scotland. He sought the authors' views on this important point. He was interested in the efforts that the Wales Board was making to save coke by using low volatile coals in producers for water gas manufacture. Probably they would all wish to move in this direction. He asked whether the sulphur content of the gas made in this way was an embarrassment if coal was simply being substituted for coke in a water gas stream.

Coke from Other Areas

Mr. Edwards said that the important question of coke supply had occupied his Board's attention for some time. One point to be borne in mind was that in the South Wales coalfields naturally smokeless fuels were produced. Furthermore, they could not defend the making of coke if this meant that gas had to be flared away to the atmosphere. If they did not themselves make the coke to satisfy customers' requirements, the Wales Board must turn to the people who did make it. This came back to the word 'co-operation,' which Mr. Tate had used, and discussions and negotiations were now taking place. At the same time, the possibility of neighbouring boards supplying coke to South Wales was being examined. A similar set of circumstances arose in North Wales, where a rapid change would take place in the coke production situation. His Board had a close relationship with the North Western Board, and the question was at present being considered jointly. There was no 'iron fence' around gas boards in respect of gas or coke.

In reply to Mr. Tate's question as to whether difficulty was experienced from sulphur in the use of coal instead of coke for water gas plants, he thought there had been no difficulty.

Mr. S. L. Wright (joint author) confirmed that it made no difference to the H_2S content and that there had been no difficulty.

Mr. Edwards added that the use of coal instead of coke for water gas production would agree with Mr. Tate's conclusion: there would be a reduced thermal output when using coal instead of coke when a mechanized grate was in use, but when hand sets were in use this was more than offset by the reduced time for clinkering. From the latter, he would expect an increase of 10% over and above the time when coke was used.

A Great Achievement

Dr. J. Burns (North Thames Gas Board) said that if the nationalisation of the gas industry had done nothing more to its credit, it had saved at least a million tons of coal in the Wales Gas Board area, which was a great achievement. It was criminal to waste gas of the quality of coke oven gas. In other words, a high calorific gas like coke oven gas should not under any circumstances be wasted. The Wales Board had done wonders so far, but it was still using high-quality coke oven gas for firing coke ovens during the summer. Mr. Edwards had spoken of the efforts they were making to meet this situation, even to the extent of selling gas at cheap summer rates. He wished Mr. Edwards success in this respect, because, clearly, the base load should come up to the total amount of coke oven gas available, at least, and the seasonal load should be met by other means during winter.

He was very interested to hear of the use of low volatile coal in water gas plants. This was a method which might spread to other areas, but it was largely a question of the coke/coal price differential. In work which he had carried out before the war, he had found that low volatile coal—about 14% volatile—could be gasified with a great degree of ease in an ordinary carburetted water gas plant. It was true that the cycle and the fuel bed required to be altered, but, all in all, carburetted water gas could be made from those coals at about 84% of the thermal output obtainable with coke. It was largely a question of economics whether one would use low volatile coal or coke. It might be that the value of coal would increase materially when the Beaver Report finally found its feet, and this would make the use of low volatile coal more attractive.

Gas Industry Must Turn to Oil

He was interested, too, in the Wales Board's use of oil and its affinity, so to speak, with the Llandarcy refinery plant. Tremendous advantages were offered to any area board which happened to have a refinery in its area. There was no doubt that the gas industry must turn to oil in a big way, in the immediate future at least; and if the coming of atomic energy had to be awaited for coal to be available, there was all the more reason why more should be known about the gasification of oil at the present time.

The utilization of refinery gases was of great importance, and the industry really must, and could, make use of these in an economic way. There was no reason why the industry should not go right into the crude oil business. The North Thames Gas Board had done quite a lot of work on the gasification of crude oil in ordinary water gas plants. They found it suitable to top the crude oil, taking the petrol off it, and then it was much easier to handle. The conditions for gasification were much more stable if the light spirit was taken off, and then the light spirit could be gasified very effectively. It might be that the refineries would find it suitable to sell to the industry light spirit in the form of gas. He did not think it would be wise to take the Wales gas grid as a pattern for all grids because, as Mr. Tate had pointed out, there was practically no coke associated with the Wales Gas Board. The conditions under which gas by itself could be carried by main were very different from those under which both gas and coke could be carried. In the case of a two-fuel industry, as in big centres of population such as London, the distance that gas and coke could be carried was relatively short.

A Comprehensive Picture

Mr. H. D. Greenwood said that he had had some connection over several years with the work of the authors in their development of an integrated gas supply system in North and South Wales, and he was glad they had described their development in gas supply against the background of the supply and demand for all types of fuel and energy in Wales. This gave a comprehensive picture of the fuel position. The two areas mainly dealt with—the industrial South Wales, and the mainly non-industrial North Wales—were obviously entirely different. South Wales was becoming one of the major steel producing areas in the country, and about 4 mill. tons of coal were

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being carbonized in coke ovens almost entirely to provide coke for iron and steel production. The advantages of utilizing coke oven gas, and the advantages of building a gas grid to connect coke ovens and towns, had been appreciated many years ago, and before nationalisation a committee was set up to prepare proposals. It had been the responsibility, however, of Mr. Edwards and his colleagues of the Wales Gas Board to put the scheme into being. Not content with this major operation, they had decided to build a gas grid in North Wales to couple up relatively remote centres of consumption.

The authors were among the first to appreciate the possibility of using methane from coal mines to supplement their own production, and they had made arrangements to take methane from the Point of Ayr Colliery. On the average, coke oven gas represented about 75% of the gas used in South Wales. In summer, it represented nearly 90%. In fact, there was enough coke oven gas to supply the whole gas requirements, and some of this gas had to be used on boilers at the coke ovens in the summer since the gas board could not take the whole available quantity. In effect, therefore, both the Gas Board and some of the coke ovens reduced their output to the gas grid to accommodate the lower summer demand.

Summer and Winter Demand

The paper showed that in 1958 still more coke oven gas would be available, in both the Eastern and Western sections of the grid. The new Coal Board coke oven plant would by then be in operation, and more gas would be available from the Steel Company of Wales. This would still further aggravate the problem of summer and winter gas demand, and the Coal Board was having to install a power plant at its new coke ovens to use a large proportion of the gas made, which could not be taken by the Gas Board.

He hoped that the demand for gas would increase, and so reduce the quantity to be burnt under boilers in the summer, which was not a very satisfactory use for a high grade fuel like coke oven gas. He did not know how the extra gas in the Western section would affect the position, but he had read about large new gasworks being erected in an adjoining gas board area. He had intended to ask why the authors did not contemplate taking some of the surplus gas from the adjoining area board, but Mr. Edwards had anticipated the question and said that arrangements would probably be made to transmit gas from the Wales Gas Board to the adjacent area board. He was glad to know that a committee had been set up to study the problem of transmitting gas between one area board and another.

Steel Mains

It was pleasing to learn that the Wales Board was going in for steel mains and high pressure distribution. In spite of the fact that steel mains and high pressure distribution were almost universal in Continental countries, there was considerable reluctance at home to depart from cast iron and low pressures. A small diameter main to operate up to 13 atms. was to be laid in North Wales, and some of the Western grid in South Wales would be designed for a similar pressure. Mr. Edwards and his colleagues were to be congratulated on breaking away from tradition, and from his own experience of Continental work he was sure that they were doing the right thing.

Some of his own recent rough calculations were confirmed by the authors' calculations that the cost of coal transport had risen to a greater extent than that of gas compression. It was a pity, however, that the higher pressure mains could not be brought right back to the source of gas supply. The Germans had for some time been operating the by-product recovery at a coking plant with about 8 atmos. pressure and said that they could save 10 to 15% on capital and operating costs in this way. The heating of coke ovens by producer gas from low grade fuel had also been mentioned as a future development. At present, coke was used as a fuel, but this put up the cost of the rich gas that was released.

The German plant mentioned by the authors was, presumably, the Ruhrgas process, which used a high ash coal to make producer gas. It was claimed that by this process producer gas could be made for the same price as the rich gas which was released. If this was substantiated—it had only just started in operation—it should be possible to fire coke ovens by producer gas made from coal and to liberate the gas at roughly the same price at which the rich gas was normally sold. The industry would then be in the position which Dr. Burns had suggested it should try to achieve.

Domestic Supplies Falling

Dr. A. C. Monkhouse (Fuel Research Station) said he was impressed by the great change which had taken place in Wales over the last 25 years. The development of the gas grid, which 25 years ago would have been impossible, the confidence which had come from the interchange of ideas, the stabilization of industry, and so on, represented marvellous development. He, too, was concerned with the important problem of the supply of coke or smokeless fuel. The authors' figures showed that the 1953 domestic coal allocation in South Wales was 734,000 tons of miners' coal and 1,690,000 tons of household coal, presumably bituminous. If some of the miners' coal was bituminous, this would represent a demand of 2 mill. tons. In the same year, the total gas works production of coke was only 189,000 tons, and only 29,000 tons was sold in the domestic market as against 43,000 tons in 1948. In other words, domestic supplies were falling. If there should be a requirement for a smokeless fuel in South Wales, he did not see how it was to be supplied. This was one of the difficulties in the grid system where there was a unified area.

The Wales Board, apparently, had chosen 500 B.Th.U. per cu.ft. as the standard gas. He asked whether there was any difficulty in attaining this figure throughout the system where different gases were being put in. Did the properties of the gas vary greatly from one place to another, or was it possible to maintain a standard? He asked also whether the Wales Board expected any difficulty in moving gas under the pressure of 250 p.s.i.g., and whether there would be any variation in calorific value. The gas industry had always prided itself on keeping a very standard gas.

A Real Difficulty

Mr. Edwards agreed with Dr. Burns that conditions obviously differed in various areas. The coke situation was quite different, and distances were different. Each set of circumstances had to be considered independently and the effect judged. Mr. Greenwood's comments on the summer/winter demand problem came back to the fact that metallurgical coke was produced almost flatly the whole time. His Board was sensible of this real problem. The fundamental was that the high grade coke oven gas should not be wasted or used for inferior purposes. One of the only two ways of doing this was to build up the base load and make more of the peak load gas themselves. There was no certainty about the position. One of the real difficulties was that a gas board planned its production and development programme and had to cater for a normal increase in demand of, perhaps, 3½ or 5%, but quite suddenly a large new coke oven plant might come into commission. If the demand for metallurgical coke was at a higher level, it might be that the older plants which were scheduled for closing down would not be shut down, and one was left for quite a short period with a substantial increase in availability; but this increase might not be sufficient to justify the spending of capital on piping it away for a few years. Dealing with the development of high pressures right back to sources of supply, he said that Mr. Wright had looked into this question recently and had come to the conclusion that under the circumstances it simply did not pay.

Mr. Wright confirmed that with the quantities of gas that were being handled at this stage, it was not a paying proposition.

Use of Low Grade Coal

Mr. T. S. Ricketts (joint author) dealt with the use of low grade coal for releasing coke oven gas. He said that in January he had discussed the matter with representatives of the Ruhr Gas Grid in Germany. Apparently they had had great success with their slagging type of producer, which used dust of volatile content of about 15 to 16% and the fusion temperature of which must be, apparently, at least 1,400°C. They had a plant which gasified about 100 tons per day and which apparently had good results technically and economically. The Germans, however, had had one or two drawbacks. One was that they had to have a continuous

circulation of dust back to the reaction bed and this made a concentration of chlorine, from which, it seemed, there had been corrosion troubles and encrustation. But they were determined to develop the process.

The problems in South Wales were similar to those in the Ruhr. At present, the Wales Board was meeting its peak loads by underfiring the coke ovens with producer gas generated in the normal type of mechanical producer, but gasifying good quality coke. This resulted in expensive producer gas but it meant that the peak load gas released was expensive. If lower price producer gas could be produced, the process would become much more attractive, and South Wales might have sufficient quantities of the low-grade high ash content fuel available to make it possible to think about installing much the same type of plant as the Germans had. The ash content of the fuel used in Germany was of the order of 20% or higher. It appeared important to have at least 20% of ash, otherwise there was not sufficient slag running down to make the process attractive.

Mr. Edwards dealt next with the comments by Dr. Monkhouse on the difficulty of meeting the demand for coke when not very much coke was being produced. The only answer was that the Wales Board was giving the matter close attention in conjunction with neighbouring boards and with the hard coke producers in the area. It was true that the domestic sale had declined, but domestic coke had not necessarily been replaced entirely by bituminous fuel. Lower volatile coals were to some extent being used. His immediate answer regarding the difficulty of maintaining calorific value was that the Wales Board would not anticipate difficulty in maintaining 475 or 500 calorific value for the North and South Wales grids. As for the high pressure regions, the particular point of interest which he had come across in Belgium some time ago was not that there was a reduction, but that there was an increase in calorific value at the higher pressures. The removal of the inert automatically increased the calorific value of the gas.

Mr. W. T. Hird (joint author) expressed his entire agreement with Dr. Burns on the effect of the transport of coke upon the economic distance of transmission of gas. As far as the problem in Wales was concerned, there were other forms of smokeless fuel than coke. Gas itself was a smokeless fuel, and its use as a smokeless fuel might become attractive in Wales and elsewhere, because all the evidence showed that there would be a great shortage of smokeless fuel in the form of coke. By not using too much coke, Wales might be doing a service to England!

Reduced Calorific Value

Mr. Wright, dealing with the question of calorific value, said that initially in South Wales, in the Cardiff and Newport area, the declared calorific value of the gas was 500 B.Th.U., but it had been found expedient to reduce the declared calorific value to 475 in those areas so that some measure of producer gas dilution could be introduced at times when the Board was not making water gas. This gave some flexibility, when water gas was introduced in the winter to meet peak loads, to make the gas more interchangeable between summer and winter than it had been when the Board was trying to maintain it at 500. In the South Wales grid, therefore, a calorific value of 475 was being adopted, and no difficulty was being experienced in maintaining it. In North Wales, where the Board was distributing three gases—gas from I.V.C.O.s with or without carburetted water gas; coke oven gas diluted with blast furnace gass; and the methane from Point of Ayr, which had to be diluted with either blue water gas or with reformed methane —the calorific value of 500 was being adopted. The recent paper from Watson House, at the Institution of Gas Engineers' Annual Research Meeting, indicated that there was not likely to be difficulty in interchangeability, and the Wales Board certainly should not have difficulty in maintaining the calorific value of 500.

Dr. R. J. Morley said one big snag with producer gas was its low calorific value. If, on the other hand, producer gas could be used to heat coke ovens—it could be done at almost B.Th.U. for B.Th.U.—this was an easy way, in effect, of upgrading the calorific value of the producer gas to the required value. The other snag with the established producer gas processes started from coal was that one ended up with tar or hydrocarbons, and so forth, in the gases and had to clean them, and it might not be possible to put the producer gas through the regenerators of the coke ovens because there would be some deposits. It was important, therefore, to develop new gasification processes which would destroy the tar, preferably turning it into gas. He was not sure that the Germans were working on the right lines. The Ruhr gas process might prove to be rather expensive and not the process which people were seeking. But he was glad to know that there was this interest in coal producer gas, and he hoped that the Wales Gas Board would follow it up and that all the developments would not be left to Germany.

He wished the authors every success in their efforts to find additional sources of gas. What he would like to see in South Wales, for rather obvious reasons, was a terrific surplus of coke oven gas or gases of various kinds, so that it automatically spilt over into the neighbouring areas—preferably, of course, under control!

The Eastern Backbone

Dr. Colclough said that before the war, he had been connected with the building of a coke plant consisting of 880 ovens in one line in an agricultural district, with a relatively small use of coke oven gas locally. It was intended that the scheme should be connected to the small Ruhr Gas Grid—which was bigger than anything in Britain—and to establish pipe lines from Hamm right through to Hanover, Brunswick, Hamburg, Bremen and Berlin, and finally into Upper Silesia. Practically the whole of the gas required for this area was to be produced at the one point near Brunswick. Why was it not possible to connect the South Wales Grid into the benighted country of England? He noticed from the Gas Council's report that a backbone grid was being constructed from Doncaster to Northampton, with an offshoot from Doncaster to Rotherham to connect with the Sheffield grid. Hearty congratulations were due to the Gas Council on its forward approach, and he hoped that the scheme would be rapidly accomplished. Was there, however, any reason why there should not be a grid coming up from Cardiff, Newport, and Gloucester to Birmingham, connecting across to Derby, and so connecting to the eastern backbone of the country? This was a fundamental principle that should be adpoted for the integration of fuel supplies.

One of the basic problems in the transfer of coke oven gas from the steel industry to the gas industry was essentially an economic one. From a recent survey he had made of a cross section of the steel industry, it was fairly well established that the use of coke oven gas for steel making was almost identical with the use of fuel oil for steel making therm by therm: at any rate, there was a difference of not more than two therms in 58. And so the fundamental for the further expansion of this idea—which he hoped would be achieved—was that there should be a full understanding of the economic implications of the interchange.

He was anxious that the interchange of coke oven gas between the two industries should be developed. Although there was a shortage in quantity of all types of coal, there was a shortage particularly of coals of high coking value. In the past year, the two industries had been squeezed in the new prices structure, and they were made to pay a higher price per therm for their coal than any other industry. The only justification was scarcity value. It would be to the benefit of the steel industry and the gas industry to get together to determine how far the two of them together could reduce the load and the demand for these high value coals and substitute for them fuels which were in more plentiful supply.

Contracts with Steel Works

Mr. Edwards agreed that the amount of gas taken from steel works, while substantial, was not a tremendous proportion of the total production, but it was developing fast. His Board had recently made contracts with three of the principal steel works in Wales. He agreed that the closer the industries concerned could get together, the better. He could not subscribe to the view that the exchange of oil and gas was on an equivalent thermal basis, for there were other attendant advantages for the steel works process. The effect of the radiant frame and the effect upon plant output were aspects that appeared to be taken into consideration. Different people would hold different views, and the subject could be discussed at great length. Replying to the question of whether it was

not possible to extend the Wales gas grid into England, he said that the balance of availability and demand had been studied and the suggestion was now being more closely examined. The Gas Council had appointed a committee to co-ordinate the capital development plans of all area boards. In South Wales, the Wales Board shared with the West Midlands Gas Board and the South Western and Southern Boards the responsibility for investigating this type of problem, and the same responsibility for North Wales was shared with the West Midlands, East Midlands, North Western and North Eastern Gas Boards.

Mr. J. A. D. Molinari, speaking of the integration of fuel supplies, said that one point which had to be borne in mind with regard to coal resources above and alongside the mere question of calorific value was the valuable chemicals that were available in the coal; but unfortunately, as one speaker had indicated, they were regarded rather as a nuisance to be got rid of in the form of tar than as a valuable national asset. The tendency to produce producer gas even from low volatile coals in preference to coke, and then to attempt to burn the tar and the benzole that might otherwise have been saved, was rather deplorable.

Steel or Plastic Mains

Mr. C. A. Deas (Eastern Gas Board), referring to the fact that in some cases gas in its crude form was taken from the coke ovens and purified at the gasworks, asked whether the authors had considered the possibility of supplying some of the gas in its crude state to certain consumers. He believed that the Ford Works at Dagenham used crude gas in their own factory. The eastern section of the Wales grid was stated to consist generally of flexible jointed spun iron pipes, working at low pressures for a grid system. He wondered whether it would not have been better to use steel, which would leave more scope for future development of the volume of gas by raising the pressures. Later in the paper it seemed that the authors inclined towards this view and, in fact, put forward strong arguments in favour of all-steel mains. He asked whether there was any particular reason for adopting cast iron in the first place. The capacity of the Aberavon works was stated to be 30 mill. cu.ft. per day and its cost had been given as £1,200,000. On the face of it this seemed to be somewhat on the low side in view of the present-day high cost of gasworks capital plants.

He would have thought that the calorific value would have been better at a higher value, having regard to the fact that coke ovens normally produced a high value coke oven gas. With the higher value gas, one could increase the capacity of the distribution system and also affect the pumping costs at the same time. Reference had been made to the possible future trend of the production of gas from oil. It might appear heresy to say so, but one wondered sometimes whether it was right to have a dual process turning oil into gas and then burning the gas, or whether the oil should be burned straightaway.

He asked whether the authors had any experience in dropping the calorific value on the exposed section of the main over the mountains. He knew from experience that it was possible to drop the calorific value, but perhaps it was of no importance. He asked also whether there had been any trouble with expansion due to temperature extremes on the mountains between, say, mid-winter and mid-summer.

Mr. Vivian Davies asked whether the authors had considered the possibility of plastic pipes, which were being developed in Canada and the United States. He had seen these pipes manufactured in this country, and he was very impressed. The oil companies were keenly considering their use. Plastic pipes were very strong and extremely light, and it was possible to get a standard pressure of 1,000 lb. Perfect joints could be made, and these pipes seemed to have distinct advantages. They could be made up to 14 in. diameter and might be very useful for the high pressure lines. He asked whether any difficulty had been experienced in getting wayleaves. This point was always put forward by the opponents of district heating.

Mr. Edwards agreed that the loss of valuable chemicals when coal was used for producer gas production had to be borne in mind. At the same time, the tonnages at present used were relatively small, and it was necessary to think back to the quantities of tar that were used in some steelworks for firing. This was a far bigger problem. It was just a case of finding the balance and deciding what was best, taking all the circumstances into consideration. The Wales Board already supplied crude gas in substantial quantities to two heavy industrial works. The process happened to be suitable, and the presence of H_2S in the gas did not matter.

He spoke next on the question of maintaining a calorific value of 475. Normally, unless one wished to spend a lot of money on enrichment, the calorific value to be maintained must be the calorific value that the ovens themselves could adhere to when they became older. Through an integrated system, there were always new and modern ovens producing a higher calorific value; but there were the older ovens too, and a balance had to be struck. Otherwise, his Board would prefer a calorific value of 500. The question of dual process and of converting oil into gas instead of selling the oil direct could provide a long argument. When dealing with oil for a limited number of consumers there was no problem, but the object in producing gas at large stations was to supply not only large industries but domestic and commercial consumers also.

He had examined the possibility of plastic pipes when in the United States some years ago and had come to the conclusion that the plastic pipes as then developed were suitable only for use with natural gas; they suffered attack by the hydrocarbons in manufactured coal gas. Since those days, however, plastic pipes had become available which would be suitable for use with coal gas, but the question of mechanical strength had to be considered.

There had been difficulties regarding wayleaves but they were not insurmountable. By patience and by fostering goodwill on the part of everyone concerned, the Wales Board had been able to overcome its difficulties. The simple answer was that powers of compulsory acquisition had never had to be used.

The question of surplus week-end gas at steel works was a difficult problem, but he believed that it could be overcome. A project was at present being developed in the Newcastle area for underground storage in salt strata. He uttered a warning on the storage of gas in disused collieries, remembering that ground movement would have caused fissures, which had caused trouble in areas where the experiment had been tried, in that gas came out of the ground at various points.

Where producer gas plants were installed at coke ovens to satisfy the gas board, it was a question of the interest and advantage of the producers of the gas, the purchasers of the gas, and the national interest. The modern coking plants now being installed by the steel works were all compound ovens for firing with coke oven gas, whereas ordinarily they would have dealt with blast furnace gas. The Coal Board was designing all its modern plants for compound firing.

Economic Relationship

Mr. Hird, replying to questions regarding the use of cast iron pipes in the eastern section, said that some explanation was given in the paper. The job had been begun five years ago, and the Board would not be very live if it did not change its mind sometime. It was entirely a question of the economic relationship between the volume of gas carried and the distance it had to be transmitted. In the eastern sections, the volume was large in comparison with the distance. It was clear at the beginning that two and a half to three times the present requirements of gas could be carried through the grid system at a pressure of 20 to 25 lb. per sq. in. Another factor affecting the decision was that almost the whole of the mains was to be laid through areas subject to mining subsidence and in ground similarly affected. All-welded steel mains were not a happy proposition in such conditions. The flexibly jointed main—*i.e.*, rather like a chain than a rod—would stand up to mining subsidence far better than a rigid main. Steel tubes with flexible joints could have been used, but five years ago the Board did not know as much about protecting steel mains in the ground as it knew now.

The protection of mains in mining areas was a very real question. The Americans had said that they did not lay them anywhere anyway. The Wales Board, however, had to lay them in a mining area. Cast or spun iron would meet all practical requirements, and he thought that the decision was right, although for different reasons. For a change in

(*Continued on page* 589)

TECHNICAL PROBLEMS IN THE UTILIZATION OF TOWN GAS IN INDUSTRY*

We conclude, from last issue, our version of the paper presented to the Institution of Gas Engineers (Eastern Section) on February 17 by F. Dickinson, M.Inst.F. and F. Johnson, A.M.I.Mech.E, Assoc.M.Inst.Gas E.

THE authors feel that in the field of industrial gas utilization the sulphur bogey is all too often exaggerated. Sulphur removal by the gas industry is not warranted if its removal, or rather its reduction, would mean an increase in the price of gas to industry. Industry requires plenty of gas at the lowest possible price; it would be fatally easy to overemphasize the importance of providing an ideal gas of the highest purity and constant combustion characteristics, and allow the gas production engineer to price industrial gas out of business.

It is true that in the firing of pottery and the annealing of glass, economic advantages exist in using low-sulphur content gas, but in these cases the reduction of sulphur in the gas can be effected at the point of application by independent organic sulphur removal plants. The application of town gas for use as a special or protective atmosphere in both the ferrous and the non-ferrous industries is another instance where low-sulphur gas would be an advantage. In the majority of these cases, however, the sulphur can be quite cheaply and simply removed after burning, as the sulphur is then present in the inorganic form as sulphuretted hydrogen and sulphur dioxide, with perhaps small quantities of sulphur trioxide.

Variation in Combustion Characteristics

Variation in Gas Quality

The changes in the gas quality are alleged to be another handicap to the successful application of gas in the industrial field. It is felt that, while any normal variation of gravity and A.T.B. number can be tolerated, it is important to restrict such variations within reasonable limits. However, it is a poor craftsman that blames his tools. The following example illustrates how a complaint due to varying combustion characteristics was substantially overcome and, in another instance, where the complaint was traced not to the composition of the gas but to oil carried over from a B.M. meter.

The first complaint concerned a consumer using gas for flame-hardening hacksaw blades, the equipment comprising a Selas gas and air mixing plant and ribbon type burners. The blades were mechanically positioned over the flames and held in this position for a fixed time to reach hardening temperature, after which they were automatically quenched in oil. The inspection department reported an undue quantity of rejects from the sample tests. Investigation revealed that the flame length varied throughout the day, and this was traced to variation in the combustion characteristics of the gas, as expressed by the A.T.B. number.

To overcome the problem, adjustments were made to the air-gas ratio control on the Selas mixer to give a lean mixture, which produced slightly keener flames; it was found that the flames produced from the leaner gas and air mixture were almost unaffected by changing combustion characteristics. The time of heating the blades was unaffected after adjustments to the position of the blades in the flames were made.

Fig. 12 shows how flame length of an aerated burner of the bunsen type varies with the normal changes of combustion characteristics of town gas.

The second example concerned a consumer using gas for the 'necking' operation on small electric car bulbs, where, again, flame length is a critical factor in the process. It was reported that the flame size varied several times throughout the day, and the consumer attributed this fluctuation to changes in gas quality. Enquiries showed, however, that in this case the trouble was not due to changes in the combustion characteristics of town gas, but was caused by considerable quantities of oil vapour passing forward to the burner from a B.M. meter. This firm had two B.M. meters working in parallel, and it was found that, whereas one meter was passing only half its rated capacity, the other meter was working at double rating, and it was the oil vapour from the latter meter that was causing the complaint.

Variation in Gas Pressure

While the gas industry recognizes the significance of variations in gas pressure, and so takes the necessary measures to ensure a correct gas supply, the consumer is often unaware of the actual effect of gas pressure on the performance of gas equipment. The gas undertaking is approached only when the consumer is in trouble, which is frequently due to inadequate internal piping and overloading of the meter. This is not a new problem, but may assume greater proportions in the future on account of the general shortage of gas fitters. The probable consequence of such a shortage could be that consumers would employ either their own plumbers and fitters or outside contractors, who may have little knowledge of appropriate pipe sizes in relation to gas flow conditions.

Fuel Economy

The conservation of coal is a matter of national interest. It follows that this must also relate to the conservation of fuels derived from coal. It is not sufficient to achieve a high degree of efficiency in carbonization; the resultant town gas must, in turn, be used with the utmost practical efficiency.

This can partly be achieved by taking advantage of the advisory service offered by the gas industry, but, obviously, the last word is with the user, as it is largely by his own efforts that optimum efficiency will be attained. We should, however, take every opportunity to cultivate good relations with the consumer, not only to help us sell more gas, but to demonstrate to him the economic advantages of operating gas appliances at the highest level of efficiency.

During the last decade or so there have been fuel saving campaigns by a number of worthy bodies having personnel of considerable technical experience and erudition. In general, these campaigns have been mainly centred on direct coal-fired applications, offering 'Paradise regained' to owners of first-class steam boilers when using third-rate fuels, and the achievement of the millenium by capping every point of waste heat with a waste heat boiler and up-grading the efficiency of steam generation. There is a clear limit to the use of waste heat boilers in industry, and more attention could be given to achieving greater efficiency in the use of steam once it has left the boiler. Moreover, in the study of fuel economy the gasified furnace seems to have been rather a Cinderella.

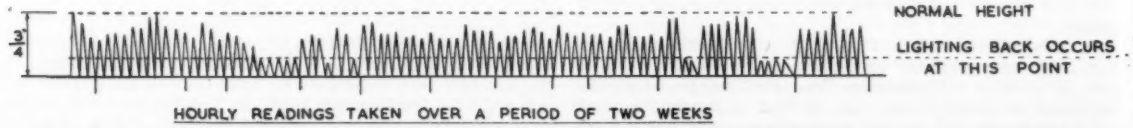

Fig. 12. Effect of changing combustion characteristics of town gas on height of inner cone of an aerated flame.

While users will readily accept any advisory service which beneficially affects their gas consumption and the production of their goods, it can fairly be stated that there are many instances where this has not been fully exploited, due to lack of co-ordination by a number of well-meaning executives. The production manager treats his furnaces as pieces of production machinery, and reacts accordingly when they have to be put out of line for repairs or renewal, but does not worry too much about his fuel consumption until it exceeds some empirical figure per unit of production. These figures are all too often accepted by management, who only seem to probe into fuel consumptions as costs tend to rise. Even then, far less importance is attached to the matter than is given to other items of manufacturing costs.

The proper application of fuel, and any developments leading to improvement of furnace design, operation or processing, with subsequent reductions in fuel consumption, should be treated as being of prime importance. In other words, wastage of fuel should be considered as vital as wastage of other materials used in industry.

Safety Precautions

The best precautions are common sense and proper concentration on the particular operation upon which a person is engaged. A contempt bred by familiarity with, and complete dependence upon, automatic controls can be the cause of accidents. The incidence of the accident rate for gasfired ovens, furnaces, and appliances, indicates that the great proportion of troubles occur at the time of lighting or re-lighting.

Safety devices are designed to 'fail to safety,' and it is essential when re-lighting to first ventilate the combustion space of the appliance and then to ensure that a pilot ignition flame has been firmly established, before commencing any re-cycling operations that will cause a large volume of combustible mixture to enter the working chamber.

There are, however, many ovens and appliances in general use without safety devices, which have been successfully operated without accidents for many years. This indicates that the proper sequence of operations for lighting the burner equipment has been achieved.

The average operator in charge of gasfired units may not be highly technical, but he is generally of normal intelligence and willing to accept some degree of responsibility. If he is trained in the approved operations of lighting. closing down, and re-lighting, he will have a personal interest in these operations. On the other hand, he will possibly be frightened by an awe-inspiring automatic control panel, complete with dials and flashing lights, and refuse entirely to have anything to do with its operation, considering it as being beyond his limited technical knowledge and duties. In view of the fact that he may be left in sole charge of a plant after installation, it is essential that he should be made *au fait* with all background and operational techniques to ensure correct operation and periodic testing of the burner control equipment.

Development Work

Pure research problems rarely come within the purview of industrial gas applications, and would require to be referred to appropriate research associations. There are, however, a number of occasions calling for development work, and progressive load building poses the necessity for investigating original development rather than only dealing with problems as they arise. The scope for this is relatively wide, and may vary from the development of original ideas to improvement of known observed practices.

Three Tentative Suggestions

It is felt that consideration could be given to a new conception of hot water central heating boiler design. The present types are often modifications of solid-fuel-fired units having a small transmitting area subjected to intense radiant and conducted heat, with flue passages through which the resultant waste gases pass to the flue. The external side of the waterways is a low temperature heat emitter of much greater area, and is generally lagged to prevent heat loss from the water at 180°F. Thus, the bulk area of the exposed transmitting surface is losing rather than accepting heat. Consequently, if heat was applied equally to the whole of the exposed area, a smaller unit could be employed to provide the same output and efficiency. In other words, the whole of the boiler should be placed in a properly lagged forced air circulation furnace, running at, say, 300°F., in the same way as an article would be placed in a process heating oven with automatically controlled temperature equipment to ensure even heating against precise and predetermined conditions.

Again, some thought should be given to the development of direct-fired hot air applications in industry. Far too little has been done in this sphere of industrial processing, and it would obviously widen the scope of gas applications.

Furthermore, in some areas there is a considerable amount of steam used for the heating of acid baths for the descaling of ferrous bars, tubes and sheet—a load where gas is rarely used owing to the inherent difficulties of application. The condensed steam dilutes the acid to a point where it becomes sluggish in action and reaches an overflow level; a quantity of the resultant liquid has then to be withdrawn and reconcentrated to allow satisfactory disposal of this effluent, and new acid added until the correct strength of liquid has been re-established. This is a real and expensive problem for the users.

The suggestion is that if they reversed the process procedure and warmed the load and carrier to a suitable temperature, say 200 to 250°C., these would heat the liquid on entry, and the time taken for the operation would be reduced, as the acid attack is at its optimum when the operating temperature of the liquid is about 60°C. Normally the liquid temperature falls from 60°C. when a new load at 50 to 55°F. (the shop temperature), is placed in the bath, and there is a delay until 60°C. is regained, after which the acid becomes really active. All that is required is a portable hood which could be heated by simple gas burners, hot air, or waste furnace gases, and placed over the load and cradle for preheating. It is expected that by this application the usual process time of one hour per ton of material could be materially reduced.

The above are put forward as possible lines of development, but the next two instances are factual evidence of work done in conjunction with consumers.

Solution Treatment of Aluminium Alloys

The use of a salt bath for the solution treatment of aluminium alloys, and a hot air oven for age hardening and annealing, are such common-place features in industry today that a reference to this class of gas-fired equipment may seem somewhat out of place at this point. The use of the hot air oven for the solution treatment of these alloys is not, however, so well-known as the following enquiry reveals.

Recently, a consumer in the Sheffield and Rotherham Division of the Board placed an order for a salt bath for the solution treatment of aluminium alloys for aircraft manufacture. It was suggested that the particular requirement would best be served by the use of a hot air oven instead of a salt bath. The advantages of the hot air oven were readily appreciated by the managing director of the firm, who was finally persuaded to enquire into the possibilities of its use for this purpose.

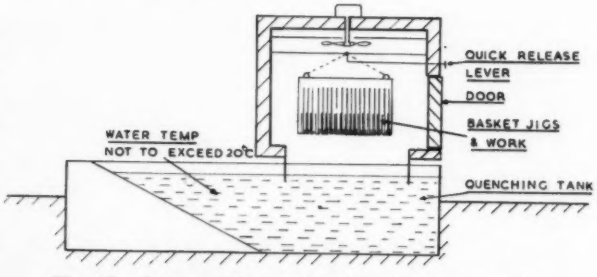

Fig. 13. Suggested layout for bottom-type quenching.

It is interesting to note that the consumer decided to instal a gas-fired hot air oven, and that this oven has now been in operation for eighteen months, giving satisfactory results; indeed it is found that not only consistent hardness figures are obtainable, but less distortion of the components occurs when using a hot air oven, this being attributed to the slower rate of heating as compared with the salt bath method.

Fig. 13 shows a suggested method of arranging the quenching tank as the floor of the oven. By this means, rapid quenching is possible with unskilled operators. It is

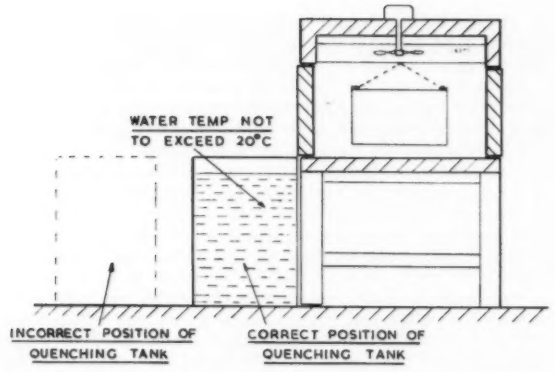

Fig. 14. Layout showing correct and incorrect positioning of quenching tank.

not claimed that this method of arranging the quenching tank as an integral part of the oven will not present problems, but its advantages seem to warrant an investigation, either by the gas industry or by the manufacturers. Fig. 14 shows the correct and incorrect methods of placing the quenching tank, the former being the one adopted by our consumer.

Cleaning of Small Metal Electrodes

The Industrial Department received a report from a firm who wanted to remove oil from small electrodes. It appeared that the electrodes were impregnated with oil from the presses during the several stages of forming. Unsuccessful attempts had been made to eliminate the oil by chemical cleaning and to contain it in the steel by electroplating. It was finally decided to heat the components with a view to driving off the oil by volatilization. The firm, however, stipulated that the heating process should neither discolour nor damage the bright surface of the electrodes. The firm stated that it required an output from the cleaning plant of approximately 6,000 electrodes per day, to be treated in batches of about 2,000. The electrodes were reported to be made of Swedish iron, and examination showed that they were almost pure iron or ferrite, containing less than 0.3% of other constituents, including carbon.

Tests showed that it was necessary to heat the components to a temperature of at least 800°C. to remove all traces of oil. It was clear that at this temperature severe oxidation would occur if both the heating and cooling operations were carried out in the presence of air. Bottled hydrogen was first tried, and found to give satisfactory results. It was felt, however, that although the excellent reducing properties of this gas have obvious merits for this application, its explosive nature presents certain hazards. It was decided at this juncture to experiment with the use of nitrogen. This gas is obtainable from the British Oxygen Co., Ltd., in

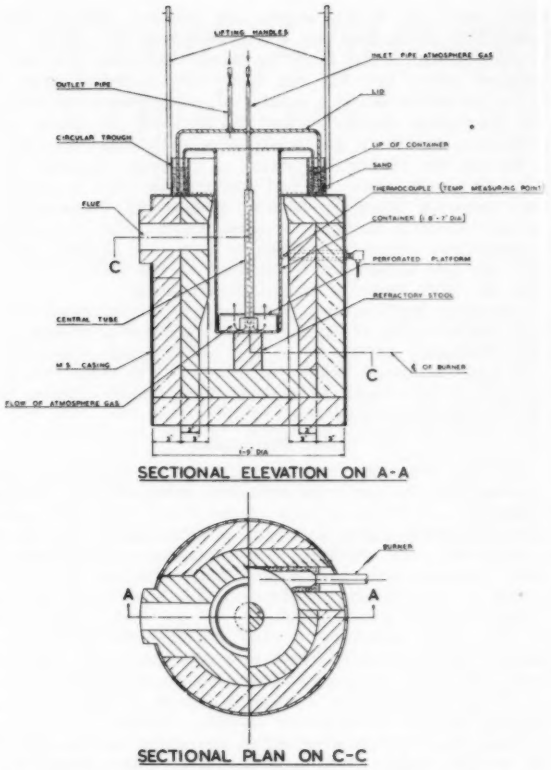

Fig. 16. Sectional elevation and plan of furnace with container used in special cleaning plant.

bottled form, as either commercial nitrogen containing up to 0.6% oxygen, or oxygen-free nitrogen. As the cost of the former is only half that of the latter, tests were first made with commercial nitrogen.

Repeated tests with this gas produced surface discoloration of the electrodes, varying from blueing to severe oxidation. It was evident, therefore, that the oxygen content of the gas was too high, and tests were then made with oxygen-free nitrogen. Results, however, were disappointing, as in many instances blueing occurred, which suggested the presence of oxygen in the gas. Subsequent tests showed that the gas contained traces of oxygen, and that whenever the oxygen content approached 0.2% blueing of the electrodes took place. Further tests with bottled hydrogen revealed that, in many instances, even this gas contained just sufficient oxygen to blue the electrodes, although the majority of tests with hydrogen produced a perfectly bright finish. Later experiments also revealed the occasional presence of just sufficient water vapour in the bottled nitrogen to cause oxidation, even when the oxygen had been removed.

Owing to the small quantity of atmosphere gas required to meet the consumer's requirements, it was decided to recommend the use of bottled gas. In view of the test findings with the use of hydrogen and nitrogen in the bottled form, it was necessary to consider measures to overcome the oxidation problems on a production basis. The measures considered were (*i*) to use either hydrogen or oxygen-free nitrogen and test the oxygen content of each bottle before use, and (*ii*) to use commercial nitrogen and incorporate in the cleaning plant a simple and cheap oxygen remover, including either a drier

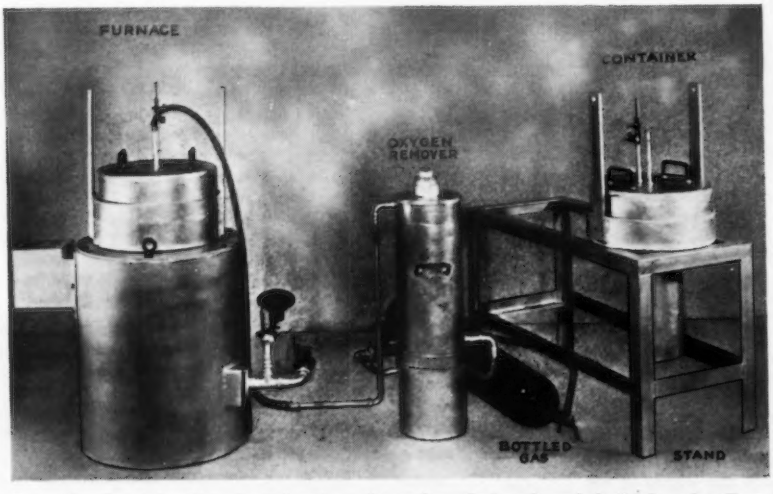

Fig. 15. Special plant for cleaning electrodes, designed and built by the East Midlands Gas Board Industrial Gas Department at Sheffield.

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of some method of converting the water vapour to hydrogen. As test experience showed that the oxygen content of the oxygen-free nitrogen was frequently above the permissible limit for bright cleaning, method (*i*) would, in practice, confine the consumer to the use of hydrogen as the atmosphere gas. Moreover, the firm concerned had neither the experience nor the equipment for gas analysis, and method (*ii*) was, therefore, adopted in preference to method (*i*). (Figs. 15 and 16.)

Conclusions

An attempt has been made to present a picture of some of the interesting problems met in everyday contacts with gas consumers in heavy industries, with an indication of the background testing that is necessary to provide effective practical solutions, and the value of close collaboration with consumers in achieving such results.

It will, of course, be realized that this is a representative example of the industrial development work that is being done by all the gas boards, although a large proportion of the problems never see the light of day because they are accepted by the industrial personnel as being a natural part of their work.

A greater realization of the benefits of wider dissemination of this type of useful and practical information is essential. At present it is only partially covered by the technical reports prepared by the Industrial Gas Development Committee of the Gas Council. Thinking in terms of both technical co-ordination between industrial personnel of the gas boards, and the education of those junior members who will eventually be expected to give a similar service to industrial consumers, there is a clear need for a considerable extension of the scope and quantity of these reports. There will only be infrequent occasions calling for the highly technical or abstruse theses required in research work; all that is sought is a steady flow of concise, factual, and useful practical reports which will assist the 'man in the field.'

INTEGRATION OF GAS SUPPLY IN WALES—From p. 585.

economic reasons, the Board was now doing something quite different, but there was no fundamental change in thought. The main across the mountain had been designed to meet an overall temperature differential of 150° F. It certainly got very hot in the summer, and very cold in the winter, and both of these extremes had now been experienced. There was a 14-ft. expansion loop every 120 yards of the main. There had not been the slightest difficulty, and none was anticipated.

Plastic pipes held great promise, but so far little was known about them and at this stage, in the absence of further knowledge regarding strength, life and other factors, one would hesitate to commit oneself to laying 100 miles of high pressure line in plastic tubing. As far as underground storage was concerned, it was one thing to pump dry natural gas underground into a permeable stratum, and quite another thing to pump coal gas. The United States Steel Company, being quite unable to sell its natural gas at Pittsburg, had bought a couple of depleted gas wells for storing the surplus coal gas underground. They had put the gas underground but could not get it out again, because the tar clogged up the permeable strata. Before development of this kind was undertaken, therefore, it was necessary to make quite certain that the gas could be got out again. The Northern Board's project involved a washed-out salt cavern. Much as Wales would like to find the storage space, the land there was so faulty that he doubted whether they would find anything suitable.

Mr. Ricketts said he was pleased that Mr. Deas regarded the Aberavon costs as low. The figures included all site preparation, water gas plants, fuel handling plant, gas holders and purifiers; but since it was coke oven gas purification, the figure did not include the carbonizer.

Mr. Deas replied that that made a lot of difference.

The President thanked the four authors and those who had taken part in the discussion.

Mr. T. Mervyn Jones (Chairman, Wales Gas Board) said his colleagues were sensible of the honour of being asked by the Institute to present their paper, which had engendered a valuable and lively discussion. He was proud to have been a colleague of the four authors of the paper.

The British plastics industry had a record production and export year in 1954. The British Plastics Federation states that output exceeded 200,000 tons for the first time, and was about 25% more than in 1953. The advance was most marked in P.V.C., polythene and polystyrene. Expansion plans now under way should mean still higher capacity this year. Exports of plastics materials alone in 1954 amounted to 70,000 tons, valued at more than £20 mill., a rise of nearly £3.5 mill. on 1953, the previous record year. The tonnage exported was more than three times that in 1947 (21,000 tons) and over 15 times that in 1938 (4,300 tons). Australia, with an increase of more than £1 mill. to over £4.5 mill., remained the best market in 1954. Exports to other countries also showed rises.

GAS COUNCIL CHAIRMAN HONOURED

Sir Harold Smith, Chairman of the Gas Council, was installed Master of the Worshipful Company of Paviors, at the Grocers Hall, London, on February 17. He was admitted to the Company in 1929, elected to the Court in 1948, and became Upper Warden in February last year. The Company has for centuries been connected with highway construction, to which the gas industry makes an important contribution by virtue of its production of road tar. Sir Harold is a Past President of the British Road Tar Association.

At the Installation banquet, Sir Harold referred to the recently announced programme of road construction which, he said, some people might think a 'little meagre.' But it was a programme which, as far as it lay in their power, they would do their best to carry out expeditiously.

Sir Harold Smith, after his installation as Master of the Worshipful Company of Paviors on February 17.

Sir John Maude, Permanent Secretary of the Ministry of Fuel and Power, proposing the toast of the Company, said he thought it was high time the country recognized the debt it owed to those who run the nationalized industries.

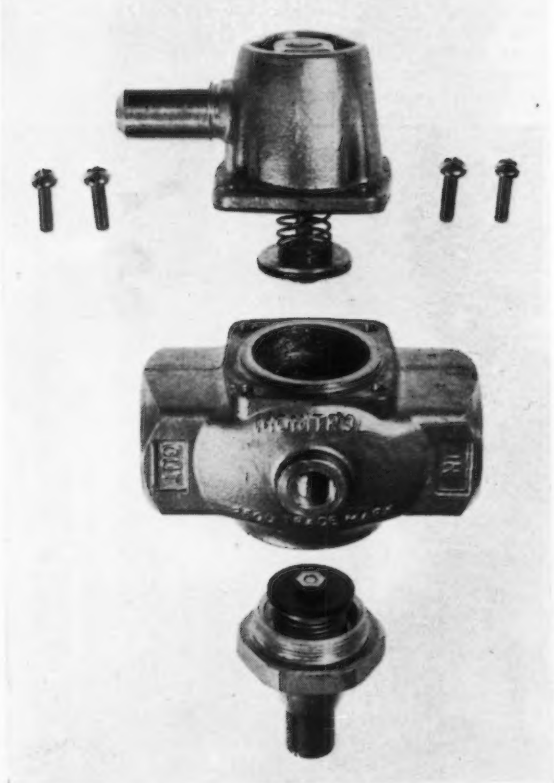
Thermo-electric Flame Failure Device*

DEVELOPMENT COMMITTEE'S REPORT

A NEW Gas Council Industrial Committee report describes the Monitrol T.S.50 thermo-electric flame failure device. The control, which is manufactured by the Monitor Engineering & Oil Appliance Co., Flaxley Road, Stechford, Birmingham 33, has the same operating principle as earlier designs of thermo-electric flame failure devices in that it relies upon the current generated by a thermocouple, situated in a pilot flame, to hold open an electro-magnetic gas valve.

Originally it was intended to make the valve in two sizes the T.S.50 (½ in. B.S.P.) and the T.S.40 (⅜ in. B.S.P.) but it has now been decided to manufacture the ½ in. B.S.P. size only and for smaller sizes the valve is supplied with reducing bushes.

The T.S.50, which we illustrate, comprises three sections, a manual reset button, a main valve body and the magnet housing. The aluminium manual reset button assembly is screwed into the base of the main valve body and comprises the flow interrupter valve and the spindle for raising the main valve. The flow interrupter is covered by a disc of



neoprene. Of die cast aluminium, the main valve body has in-line taper main gas connections at either end of the body with ½ in. B.S.P. (parallel) pilot tappings at either side. This section contains two valve seatings, the upper being for the main valve, the lower for the flow interrupter.

The magnet armature is sealed into a light gauge aluminium case which is bolted inside the die cast aluminium magnet housing. The main valve spindle projects through a gland in the aluminium case and terminates in a neoprene covered valve. A spring between the valve and magnet case ensures that a good seal is obtained when the valve closes. The magnet housing is clamped to the main body, with a sealing washer between, by four Philips screws. The thermocouple connection which is normally on the outlet side of the housing may be placed in any one of four positions since the four clamping screws are symmetrically placed. However, it is recommended by the manufacturers that, when ordering, the desired position for the thermocouple connection be stated as they are anxious to avoid the removal of the magnet assembly by persons outside the factory.

The pilot burner comprises a brass injector with a stainless steel burner head having the control and ignition flame ports drilled at 180°; two small ports are drilled between to assist the flame to run. Stainless steel hoods are fitted one above and one below the flame ports to prevent extinction of the flame by draughts or dirt. Other designs of pilot burner are available for both vertical and horizontal fixing.

The burner is attached to a cadmium plated mild steel bracket provided with fixing holes and thermo-couple clamp. The thermocouple is threaded through a hole in the fixing bracket and clamped by a bush.

Operation

To operate the device, the manual reset button is pushed upwards. This lifts the main valve off its seating and places the armature in contact with the electro-magnet; at the same time the flow interrupter closes the outlet to the main burner. Gas can then pass to the burner where it is ignited. The thermocouple situated at the pilot burner generates a current which is used to energize the electro-magnet enabling it to hold the main valve open. When the manual reset button is released, the main valve remains open, the flow interrupter is removed from its seating and gas is allowed to pass to the main burner where it is ignited by the pilot flame which is already established. On pilot flame failure the thermocouple cools and the main valve closes, under the action of the spring, thus shutting off the gas to both the pilot and the main burner.

Committee's Comments

After describing tests made on the valve, the Gas Committee make the following comments: 'When the push button assembly and the main body are assembled it is advisable to use a lubricating oil on the threads otherwise there is a risk of the threads "cold welding" which would result in severe damage to the threads on subsequent dismantling. Unless otherwise ordered a standard valve will be supplied by the makers—this has the thermocouple connection at the outlet side of the valve and a pilot burner, suitable for vertical fixing, having the control and ignition ports at 180° to each other. The makers are anxious to avoid the removal of the magnet housing by persons outside the factory since the magnet case is a very thin aluminium pressing. They would prefer the valve to be removed from the supply and returned to them if cleaning is necessary. This means that since the thermocouple is connected to the side of the magnet housing a fourfold stock will have to be kept in order to provide a valve having the connection in the required position.

'This has been discussed with the makers who state that they "cannot guarantee the satisfactory performance if the position of the valve head is changed from that in which it is supplied," but they are prepared to supply the valve having the magnet housing fixed with cheese-headed screws in place of Philips screws when specifically requested, in which case their guarantee will only hold if any adjustment in position is carried out by trained personnel.

'It would appear that this device is more suitable for makers of mass produced appliances where the requirements are known in advance.'

* From the Industrial Gas Development Committee's Report, No. 573/54, issued by the North Thames Gas Board.

Mechanical Handling of Oxide in Tower Purifiers

Notes from the discussion on the paper by C. E. Mills to the Yorkshire Junior Gas Association on December 11, an abstract of which appeared in our issue of January 12.

Mr. F. C. Barker said that Mr. Mills was fortunate—at least he hoped he regarded himself as being fortunate—in having two different methods of tower purification in his division. It was perhaps of interest to review the advantages claimed for tower purifiers in relation to box purifiers. Dealing first with capital cost it was thought at one time that towers might be cheaper, but when one added the cost of the crane and the cost of handling oxide one wondered whether there was much difference between towers and overhead boxes, especially in view of what must be the high cost of the handling systems shown by Mr. Mills. Could Mr. Mills give some idea of the cost of the plants that had been installed?

As far as operating costs were concerned, it did not seem that towers had much advantage over orthodox boxes, and in any case the margin was quite small when it was remembered that the cost of purification generally did not exceed 0.3d. per therm. Could Mr. Mills give some idea of the costs of operating tower purifiers? Did he find them cheaper than boxes?

This only left a saving in ground space as a feature particularly in favour of towers, but this might be offset by the space taken up by oxide handling plant. Having regard to the overall position would Mr. Mills favour the installation of tower purifiers, or would he consider overhead boxes, or even tray purifiers in preference? Dealing with the handling system as outlined it was not clear whether partly spent oxide could readily be rejected from the system if it was not required to be re-used immediately. Did the scheme offer full flexibility in this respect? Did Mr. Mills consider the screw mixer desirable and would he repeat it on another new installation? It was noticed that there was a difference in the period required for purging at Car House and it was much longer than the period at Neepsend. Was there any special reason why that should be so?

Dust Nuisance

Did Mr. Mills find any special difficulty with regard to dust nuisance when disintegrating dry oxide from the towers and had it been necessary to take any special measures to deal with the dust? Could Mr. Mills also indicate the man hours required to discharge a basket since it seemed, from the information given, lower than previous cases which he had come across. Finally, Mr. Barker wondered why Mr. Mills persisted in attempts to develop an electrical tool, and he would be glad to learn what objection he had to the continued use of compressed air which was in general application in purification work.

Mr. A. Cole put the following questions:—(1) Is the electric spade cheaper than compressed air when using a diesel-engined mobile compressor? (2) What is the basic cost per therm of purification when using tower purifiers as against normal boxes? (3) Are tower purifiers the answer to purification problems? (4) How have maintenance costs turned out in connection with corrosion of the steel structures?

Mr. Stubbs asked what teething troubles had been encountered.

Mr. Atkinson asked whether non-sparking tools were being used.

Mr. Wilkinson wished to know whether the author and his colleagues had experienced any troubles due to back pressure.

Mr. Mills, replying to Mr. Barker, said the approximate capital costs of tower purifier installations, including foundations, were Neepsend, £280,000; Car House, £370,000 (estimated). The capital costs of the oxide handling plants were: Neepsend, £40,000; Car House, £25,000.

He agreed that the margin was small but one had to consider the total number of therms purified per annum. The cost of purification in tower purifiers was approximately 0.1d. per therm less than in the average type of box purifier installations. The ground space required for tower purifiers, including oxide storage space was: Neepsend, 1,200 sq. ft. per mill. cu.ft. per day; Car House, 1,500 sq. ft. per mill. cu.ft. per day; box purifier: (5 mill. cu.ft. capacity), 2,500 sq. ft. per mill. cu.ft. per day.

From experience gained in the Sheffield and Rotherham Division, tower purifiers had many advantages over box purifiers, but as stated in the paper, they could only be justified where not less than 7 mill. to 8 mill. cu.ft. of gas per day was purified. The system was fully flexible, and partly spent oxide could readily be discharged from the system via the same conveyors as those for spent oxide for sale or to stock, and could be re-introduced into the system in the same way as new oxide. Mixing of new and part spent material was desirable but a screw mixing conveyor would not necessarily be repeated on a new installation.

There was no specific reason for a longer purging time at Car House than at Neepsend. It was hoped to improve on the time taken at Car House with experience. Dust had not proved troublesome since the disintegrator chute was connected direct to the boot of the elevator and little dust escaped to the atmosphere. As stated in the paper, two baskets per day were emptied and refilled at Neepsend and it was hoped to improve on this time with the full-time use of pneumatic spaders. There was no objection to the use of compressed air tools; they were most reliable but the cost of compressed air for operation exceeded the cost of electricity.

In reply to Mr. Cole, Mr. Mills said that even using diesel operated mobile compressors—and these were usually more expensive to operate than fixed electrically-driven air compressors—the electric spader should be cheaper to operate than one using compressed air. Tower purifiers with hydraulic valves were, in his opinion, the most reliable way of purification. They might, however, ultimately be replaced by one of the new methods of purification now being developed. He regretted that he had no details of maintenance costs but from experience on the Neepsend towers, painting would be required every three to four years. No appreciable corrosion had so far taken place on the interior of the towers or on the trays at Neepsend.

Teething Troubles

Replying to Mr. Stubbs, the author said that the teething troubles on the oxide handling plant at Car House were the rate of feed of the oxide from the hopper to the roll breaker, the technique required for operating the travelling crane, and the positioning of the trays. As regards Mr. Atkinson's point, non-sparking tools were used in all box type purifiers but one of the advantages of tower purifiers was that steel tools, which had a longer life, could be used.

In answer to Mr. Wilkinson's query, the author said that no troubles had been experienced with back pressure, 2 in. w.g. being an average pressure differential on a tower.

Lord Salisbury, Lord President of the Council, in a speech read for him by Mr. Selwyn Lloyd, Minister of Supply, at a luncheon in London of the Parliamentary and Scientific Committee, said that the Government was proposing considerably to expand the facilities for technological education in a number of universities and university colleges. We had still not nearly enough high-grade scientists and technologists. To fill the expanding university departments we must also increase the numbers of able young men and women coming forward from the schools. We had first to persuade more boys and girls who were reading science to stay on at school until the age of 18, and must then persuade far more men and women of the right type to adopt science teaching as a career.

Royal Visit to Partington Works

Last Wednesday, the Duke of Edinburgh, whose interest in all matters affecting the industrial welfare of this country is so well known, visited the Partington works of the North Western Gas Board.

On February 23 the Duke of Edinburgh conferred on the North Western Gas Board the signal honour of visiting the Board's Partington works. His visit was semi-private, and he was accompanied only by his Equerry, Squadron-Leader Beresford Horsley, A.F.C., and his personal detective, Inspector F. Kelley. He flew his own aircraft, a Dove, from London to Ringway, where he arrived punctually on scheduled time, 11.15 a.m. On alighting from the 'plane, he was greeted by the Chairman of the Board, Mr. D. P. Welman, and the Deputy Chairman, Mr. A. Henshall.

Mr. Welman accompanied the Duke to Partington in the Royal car, a Daimler flying his personal pennant, and he was able during the 25-minute journey to give him an advance picture of what he would see. Mr. Henshall accompanied the Duke's Equerry in the second car. The Duke's personal standard was flown over the works at Partington when he arrived at 11.45 a.m. until he left again for Ringway at 3.30 p.m.

When the Duke arrived at Partington Mr. John Wilson, the General Manager of the Manchester Group, was presented to him. The Duke then spent 20 minutes in the Board Room, where Board Members and some principal officers were presented to him. Mr. W. Hodkinson, Chief Technical and Planning Officer, then explained to the Duke the rôle of Partington in the Lancashire-Cheshire gas grid.

Fig. 1. Left to right: Mr. T. Nicklin, Board Production Engineer (wearing glasses), Mr. M. Redman, Assistant Production Engineer, Mr. N. Hoyle, Deputy Station Engineer at Partington, the Duke, and Mr. D. P. Welman, Chairman of the Board.

Immediately afterwards he set out by Land Rover on his tour of the works accompanied by Mr. D. P. Welman, Mr. A. Henshall, and the other Board Members. During his tour of the works he spent half an hour inspecting the Woodall-Duckham vertical retort house, where half of the 32 retorts have been converted for the carbonization of coal by the 'Rochdale' process.

After a 15-minute visit to the Humphrey and Glasgow all-automatic carburetted water gas plant, he dropped in to the men's canteen and entered the kitchens where the men's midday meal was being dished up. Both in the

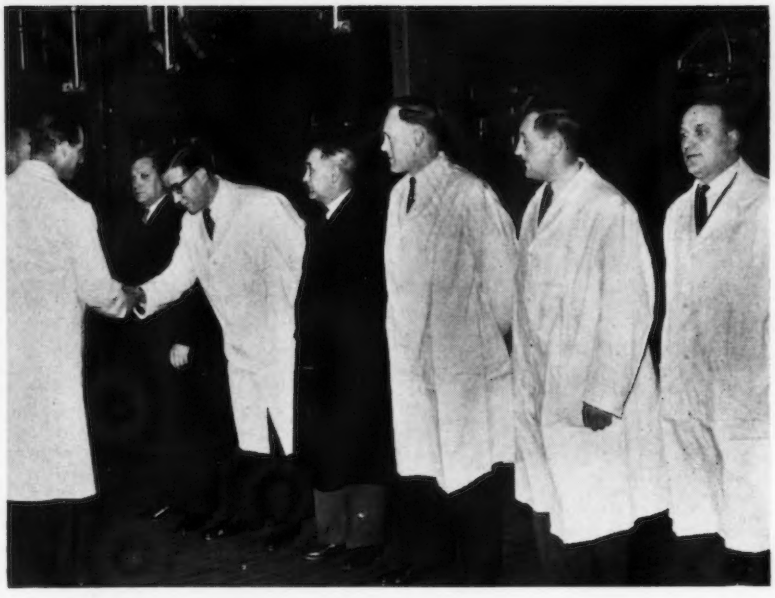
Fig. 2. Mr. W. Hodkinson, O.B.E., Chief Technical and Planning Officer of the Board, explaining to the Duke the controls of the vertical retorts converted to the Rochdale process. Behind the Duke, left to right, are Mr. John Wilson, General Manager, Manchester Group, Mr. T. Nicklin and Mr. M. Redman. Mr. Nicklin and Mr. Redman were associated with the development of the Rochdale process.

Fig. 3. In the Woodall-Duckham vertical retort house at Partington the Duke of Edinburgh operated the controls which automatically discharge the retorts. He is seen speaking to Mr. T. Ashton of Urmston, a stoker, who explained to him the simplicity of the procedure required for working the retorts.

kitchens and the canteen, where about 200 men were waiting for their luncheon, he chatted informally with individuals picked at random.

The next point visited was the new compressor house containing the five large compressors driven by electricity at present taken from the grid, but eventually to be generated on the works by steam produced from waste heat. Here he unveiled a plaque commemorating his visit, pressed a switch which set all the compressors in action, and spoke to the assembled company of senior officers, staff, and workpeople of his interest in the efforts the gas industry is making to keep moving ahead the better to be able to serve homes and industry.

After his visit to the compressor house he returned to the Board Room where he met the Group General Managers and principal officers of the Board. This interlude was followed by a luncheon in the canteen annexe given to him personally by the Chairman, Deputy Chairman and Board Members, and all those officers of the North Western Gas Board present at the luncheon.



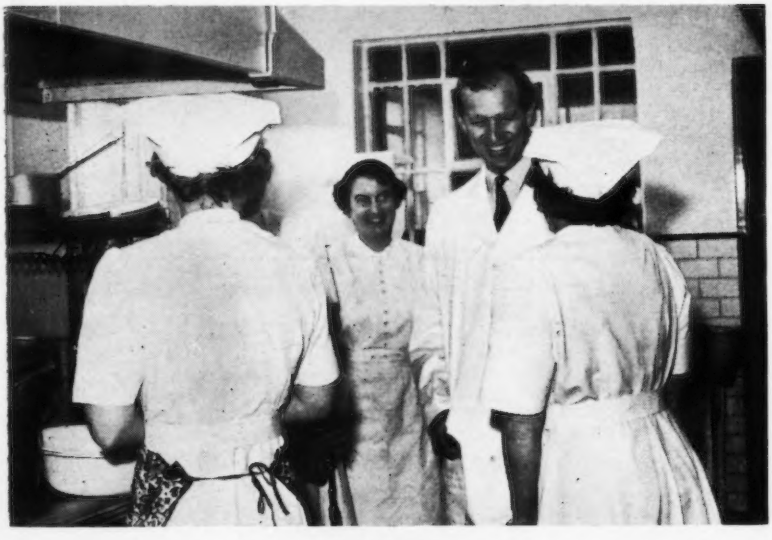


Fig. 4 (above). A number of Board officials being presented to the Duke. (Left to right): Mr. F. Litler, Deputy Chief Technical and Planning Officer of the Board (wearing dark overcoat); Mr. T. Nicklin, Board Production Engineer (shaking hands with the Duke); Mr. T. D. Olver, Manchester Group Production Engineer; Mr. M. Redman, Board Assistant Production Engineer; Mr. N. Hoyle, Deputy Station Engineer at Partington; and Mr. J. McDonough, Retort House Supervisor.

Fig. 5 (left). During his visit the Duke spent some time in the kitchen of the men's canteen at Partington works and met a number of the Board's Home Service Advisors who prepared the luncheon given to him by the Chairman and Board Members and Officers present at the luncheon.

Fig. 6 (below). Immediately after unveiling the plaque in the compressor house the Duke pressed a switch which set the compressors in operation. On the dais with the Duke is Mr. D. P. Welman.

It was explained to the Duke that the works at Partington is of special interest for three reasons. It will eventually become the key production station for the Lancashire-Cheshire gas grid; it is the first works in the world to be fully equipped for the carbonization of coal by the 'Rochdale' process; and finally, it is one of the few works where gases produced from the cracking of oil are blended with other gases and then distributed as part of the ordinary supply.

At each point visited, the technical officers primarily concerned and a number of the workers employed on the plant were formally presented to the Duke, and at the compressor house among those presented were five apprentices chosen by lot from among 102 names in the Manchester Group. The whole visit was marked by a most cheerful informality, and everybody who had the privilege of speaking with the Duke was deeply impressed by his profound knowledge of industrial matters.

COMPANY NEWS

CALOR GAS

Calor Gas Holding Company is raising the interim dividend from 10% to 12½%, less tax, on the £492,486 one-class capital, in respect of the year to July 31, 1955. A final payment of 20% made 30% for 1953-54.

PULSOMETER ENGINEERING

The Pulsometer Engineering Co., Ltd., Reading, has appointed S. W. Carty & Son, of 12, Lower Mount Street, Dublin, as agents for Eire in succession to Mr. H. M. Moore. They will be representatives for all lines of production, pumps of all types, refrigeration and water purification plant, with the exception of aircraft fuel pumps, vacuum pumps, and oil refining pumps.

PROPOSED DEAN-BURCO MERGER

The accidental omission of two lines from the paragraph about the proposed merger of W. H. Dean & Son, Ltd., and Burco, Ltd., published on p. 528 of the 'JOURNAL' last week gave a misleading version of the basis of exchange of shares which the accountants had declared to be fair and reasonable. The figures should have read: (a) For each 5½% cumulative preference share of £1 of W. H. Dean & Son, Ltd., one 6% cumulative preference share of £1 of the new holding Company; (b) for each ordinary share of 5s. of W. H. Dean & Son, Ltd., one ordinary share of 5s. of the new holding Company; (c) for every four ordinary shares of 5s. of Burco, Ltd., five ordinary shares of 5s. of the new holding Company.

DE LA RUE AND S. FLAVEL

The Boards of Thomas De La Rue & Co., Ltd., and Sidney Flavel & Co., Ltd., announce that the negotiations with a view to merging their interests in gas, solid fuel and heating appliances have terminated, without it being found possible to accomplish the object in view.

ALLIANCE AND DUBLIN

The Alliance and Dublin Consumers Gas Company announces a final dividend of 3½%, making 7% for the year, the same as for the previous year. The revenue surplus, after tax, is £93,971 against £92,029. After providing for debenture interest there remains £79,011. The balance carried forward is £26,879 compared with £21,233 a year ago.

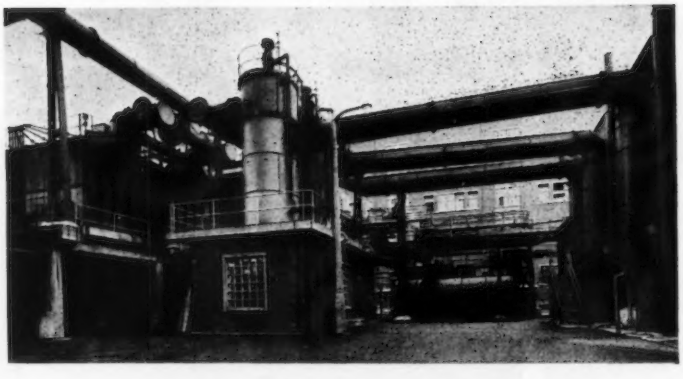
METERS, LTD.

The Directors of Meters, Ltd., propose to increase the authorized capital of the Company to £500,000 by the creation of a further 150,000 £1 ordinary shares and to capitalize £150,000 from the general reserve fund and make a bonus issue of these ordinary shares to the ordinary stockholders on the basis of three new shares for every four £1 units of ordinary stock. The new shares will rank *pari passu* with the existing ordinary stock as regards dividends, but as the proposed issue will in no way affect the earning capacity of the Company, it must not be presumed that there will be any increase in the amount distributed by way of dividend.

Bradford Smokeless Zone

In connection with a scheme to create a central smokeless zone at Bradford the Corporation has been putting its own house in order, and items have appeared in the minutes of the City Council from time to time recently indicating that the necessary measures are being taken to avoid smoke. For instance, at the last meeting there was a request that the Council approve the spending of £30 on two new gas fires for the Markets Department. There has been alteration and adaptation to the Town Hall heating system, and the big chimney there will not in future be one of the worst offenders in discharging smoke as it has been in the past.

The decision of the Health Department not to give a grant to the firm which is converting its fireplaces is presumably an indication of the general policy, and it is understood that grants will be given only in cases of individual hardship.



Photograph by courtesy of the North Thames Gas Board

The riveted steel mains shown in this illustration were erected by us at Bromley-by-Bow Gasworks

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GAS STAFFS' WEEK-END SCHOOL

Claimed To Be First Ever

The East Midland District Committee of the National and Local Government Officers' Association held a week-end school for gas staffs at 'The Hayes,' Swanwick, Derbyshire, last week-end. About eighty people took part in what was described by Mr. T. J. Du'B. Keefe, Chairman of the East Midlands Committee, as the 'first week-end school for gas staffs ever to be held in this country.'

Well-known authorities gave talks on different subjects, and these were followed by open discussions. A 'school forum' concluded the week-end. On the Saturday evening members attended a dance in the ballroom of this spacious house, which is a popular conference centre set in beautiful grounds.

Mr. Keefe, who was called upon to open the school, said it had some historical significance, for it was the first week-end school for gas staffs to be held in this country.

He went on to say that education was no one-sided affair: 'It is a harmonious relationship between employees and staff, in which the employers fully recognise the importance of providing proper facilities.' This, he thought, was well-illustrated by the fact that the area Board had their own enlightened policy towards making a good and satisfying career in the gas industry.

Examinations Contentious?

In his opinion, any measures designed to assess human ability were almost always contentious, and the examination medium was no exception. Nevertheless, with all its limitations there was no easy alternative. 'You just cannot expect employers to take you at face value. In short, theory and practice must always be married.'

Education, said Mr. Keefe, should not be an end in itself; merely a means to an end. Having secured a qualification, the 'rest on our laurels' attitude was to be deprecated. 'In these enlightened times vast sums are spent on education and so exists not only an obligation to your employers, but also an obligation to the community,' he added.

Concluding his opening address, Mr. Keefe said he could see the era of the clerk, 'purely as a clerk,' passing out. With modern office machines for office work, the time was on the horizon when a few marks would be put on paper and the machine would do the rest.

Next to take the stand was Mr. F. L. Ffoulkes, Industrial Relations Officer to the East Midlands Gas Board, whose quiet, humorous manner and plain speaking brought him considerable attention. He asked straight away: 'What does an employee want in his job?' Generally, he submitted, the pay packet transcended all other considerations and represented about two-thirds of the wants of an average employee. 'The pay packet, however, is not all,' he said, 'I think that an employee also wants some of these other things: Friendliness from his colleagues; fair treatment from his manager; good working conditions; security of employment, prospects of promotion; and a sense of worth-while service.'

In stating what he thought the employer wanted, Mr. Ffoulkes stressed that loyalty was a prime and basic requirement. 'Has the disloyal, overcritical and disgruntled employee the right to expect loyalty and support from his manager when he gives none himself?'

On education, he said he regarded it, as distinct from training, as the effort an employee made himself to widen his knowledge in his profession for the benefit of himself and his employer.

Promotion

Mr. Ffoulkes, discussing promotion, claimed that there was inevitable conflict between merit and length of service. 'In my opinion, while one must acknowledge the claims of service, merit must come first. An organization which promotes on service alone, with the resultant stultification arising from good men being kept down and poorer men occupying senior positions is doomed to founder and die.'

Towards the end of his talk, Mr. Ffoulkes said: 'The record of the industry in the past and in the present shows that there was an overdue need for reorganization into larger units—I am not talking about the political considerations of nationalisation—and it is stupid to bemoan the passing of the "good old days" and like the ostrich to stick one's head in the sand. Moreover, were they always such good old days?'

Mr. E. H. Harman, Deputy Chairman, East Midlands Gas Board, entitled his address 'The economic structure and operations of the East Midland Gas Board.'

His analysis took five main headings: (1) A survey of the initial capital structure of the Board; (2) The growth of gross and net capital liability since vesting date; (3) The capital expenditure undertaken by the Board; (4) An analysis of the Board's revenues; and (5) The cost of gas and the development of the Board's gas manufacture and distribution policy.

Said Mr. Harman: 'I would not go so far as to say that our economy is balanced on a knife-edge. Nevertheless, it is a balanced economy and it could easily be upset. We believe that, in the interests of the gas consumer we should, to use a yachting term, "sail very near to the wind." We think our past record shows us to have achieved this and we have every hope of continuing in the same fashion.'

Mr. J. H. Dyde, Deputy Chairman, Eastern Gas Board, was the speaker on Sunday morning. He spoke on the past, present and future of the gas industry and traced its history through five phases. The first, he said, was recorded as the period of its early struggles of 1880, when gas was developed as a lighting medium, with greater convenience and flexibility in application than anything hitherto devised. 'The effect on civilized society of the day of this new illuminant is often not fully appreciated,' he asserted.

The second phase—1880-1900—saw the emergence of electricity as a serious competitor for light, and the gradual change to the use of gas as a heating medium, following the application of the atmospheric burner invented some years earlier by R. W. Bunsen. The introduction of the prepayment meter in this phase had a powerful influence in developing the use of gas by the small domestic consumer.

The next phase, 1900-1920 was characterized by the commercial development of the industry as a heating service, said Mr. Dyde. This culminated in legislative recognition that gas could be sold on a heating basis on a declared calorific value. Two new manufacturing techniques—carburetted water gas plant and the continuous vertical retort were introduced on a large scale.

1920-1948 was an era of great expansion of the industry's commercial organization to meet increased competition. Meanwhile, the engineers strive for increased production efficiency. While discussing this phase, Mr. Dyde reflected: 'One just wonders what more favourable position the gas industry would be in today if it had been possible then to carry out the policy of integration and concentration of production into larger and more efficient manufacturing units that with a few exceptions, has had to wait a further twenty years and more until the industry has been nationalised.'

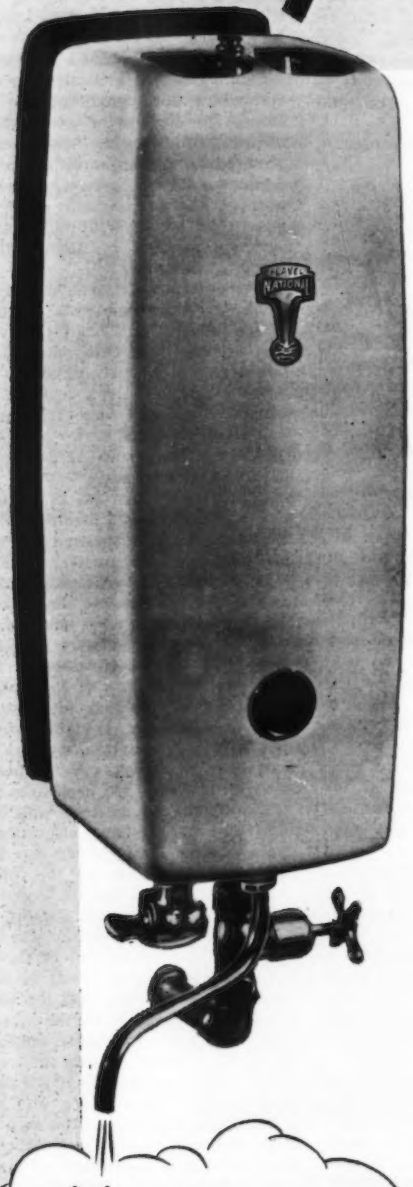
Finally, Mr. Dyde dealt with the present period since nationalisation. He spoke of the ideals of the gas industry and of the prospects for the future, including natural gas ind the opportunities presented by the Beaver Report.

About the latter, he remarked: 'The successful implementation of the Beaver Report could place us firmly on the basis of a two-fuel industry, with the two fuels as equal partners. If, on the other hand, coal price and availability continues to move still further against us, a swing towards an oil economy and the complete gasification of non-caking and inferior grade coals would place us as a single-fuel industry. In this respect, the developments in gasification of low grade coal at high pressure in the presence of steam and oxygen now taking place at the Birmingham Research centre of the Gas Council are of the utmost urgency and importance.'

Mr. Dyde concluded his talk: 'I would like to leave you with the picture

(*Concluded on p.* 598.)

Presenting



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Specifically constructed for use with either hard or soft water, the operation of the valve is calculated to ensure smooth combustion. The Flavel National provides nearly half a gallon of very hot water per minute and this supply, according to the temperature required, is unending.

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The Flavel National can be consumer maintained. By the removal of a single knurled nut, the outer casing is easily detached. The heat exchange unit can then be unhooked from the vitreous enamel backplate and washed under a tap. This whole operation, which should be carried out periodically, occupies less than five minutes.

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(*Concluded from p. 595.*)

of the gas industry alert and poised to pursue one or other of the many avenues of advancement that the future must inevitably throw up, and ready, if need be, to shake off the traditional practices and techniques that have seen it though a century-and-a-half of public service.'

Presiding over the 'school forum' on Sunday afternoon was Mr. Sydney Smith, Chairman of the East Midlands Gas Board. Written and verbal questions were submitted to him and the rest of the panel comprised: Mr. Dyde, Mr. Ffoulkes, Mr. S. W. E. Richards, Chairman of the District Service Conditions Sub-committee (Gas); Mr. A. Gwynne Davies, Secretary, H. A. Hart, Commercial Manager, Mr. G. A. Howard, Chief Accountant, East Midlands Gas Board; Mr. G. H. Newman, National Organizing Officer, Gas Staffs, N.A.L.G.O., and Miss F. E. Pole, Honorary Secretary (N.E.C.).

Severe Test

In the teeth of a blizzard the 4,600-ton collier *John Orwell Phillips* ran loaded trials off the North East coast before handing over to the North Thames Gas Board. She is the 29th vessel built for the Board's fleet. The *John Orwell Phillips*, named after a former General Manager and Secretary of the Gas Light and Coke Company, has been built by Wm. Pickersgill & Sons, of Sunderland, and fitted with machinery by the North Eastern Marine Engineering Company. She will maintain a service speed of 10½ knots on about 11 tons of oil fuel a day.

Before the ship sailed for London, the Board told the shipbuilders that it was well satisfied with the vessel's performance in her first test of bad weather.

Heroism at Waddon Works

Two awards, one posthumous, to employees of the South Eastern Gas Board following the accident in a coke hopper at Waddon gasworks in November, were announced in the *London Gazette* of February 22. The Edward Medal has been awarded posthumously to Mr. E. J. Best (56) a plater, for his gallantry in trying to rescue a man who had accidentally fallen into the coke hopper and had been overcome by fumes. Best was himself overcome and died on the way to hospital. The Edward Medal is an award for heroism in industry. It was established by King Edward VII in 1907, and takes precedence immediately after the George Medal and the King's Police and Fire Services Medal for Gallantry.

The second award, the British Empire Medal (Civil Division), goes to Mr. C. W. Jack, an engine fitter, who went down into the hopper with Best in the rescue attempt. At the inquest the coroner told Mr. Jack 'You made a very valiant effort to save the lives of these two men'.

Stanton Development Scheme

The coke oven plant extension of the Stanton Ironworks Co., Ltd., reached the first important stage on February 24 when the heating up flares of the new battery of 44 ovens were lit by Sir Frederick Scopes, Managing Director of the Company. Sir Frederick was accompanied by Mr. G. R. Buckley, Director and General Works Manager. Also present were the following representatives of the Woodall-Duckham Construction Co., Ltd.: Mr. D. Rider, Joint Managing Director, Mr. F. P. Dyson, Director and Chief Engineer, and Mr. W. J. Chadder, Director in Charge of Sales.

When the new battery is fully in commission, the coke oven plant will have a daily throughput of 2,000 tons of coal. Local towns will benefit by the extra amount of coke oven gas available; it is anticipated that a daily total of 24 mill. cu.ft. will be pumped into the East Midlands grid.

Jenolite, Ltd., anti-corrosion specialists and manufacturers of industrial chemicals, are moving on March 14 from Piazza Chambers, Covent Garden, W.C.2, to 13-17, Rathbone Street, W.1 (T/N MUSeum 5411). For several years the company has had a number of departments operating at 13-15, Rathbone Street, but expansion led to the acquisition and conversion of a large building at No. 17, which is to be the new home of Jenolite and its associated companies.

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A Smoke Abatement Policy for Scotland

'Every Gas-fired Installation a Contribution'

The housewife could accept the views of the Beaver Committee on the effects of air pollution and grit emission, but she could not accept the Committee's proposals for dealing with domestic smoke, said Dr. Joy P. Stern, Senior Scientist of the Scottish Divisional Coal Board, speaking in Glasgow on February 9 at a conference sponsored by the Scottish Division of the National Smoke Abatement Society and the National Industrial Fuel Efficiency Service, on a smoke abatement policy for Scotland.

The Domestic Chimney

Dr. Stern added that it appeared that undue emphasis had been placed on domestic smoke emission, which at worst must be less than half the minimum smoke emission that arose from industry, or rather less than one-third of the total smoke emitted. The domestic consumer was not responsible for any grit emission, all of which arose from industrial use of solid fuel.

The proposed enforced use of smokeless fuel was criticised by Dr. Stern on the grounds that reactive smokeless fuels were not available and could be provided only at very high cost in present circumstances. This cost would not be recovered by increased efficiency in use. Gas coke was not generally acceptable to the housewife even in improved appliances. The suggestion in the report that it was unlikely that domestic appliances could be designed to burn bituminous coal smokelessly was defeatist. She suggested that a proper research effort should be made into this problem, and that a proper system of subsidies to enable the housewife to obtain smoke reducing appliances should be introduced by the Government.

Sir Patrick Dollan, Chairman of the Scottish Fuel Advisory Committee and Director of N.I.F.E.S., who presided, said that the conference, to which almost 200 town and county councils had appointed delegates, had been called to approve of the Government's decision to introduce legislation for the prevention of smoke and fog and to urge all parties in Parliament to combine to pass the legislation before the end of the Parliamentary Session in October.

All parties had expressed their unanimous agreement with the recommendations of the Beaver Committee Report recommending that powers be given to Parliament and local authorities to deal with smoke pollution of every kind.

Disgrace to Civilization

Some of the heating and steam raising plants owned by local and nationalised industries on Clydeside were a disgrace to civilization because of smoke emission, added Sir Patrick. Some of the worst offenders could be seen from the centre of the city, and at least six were within the vicinity of hospitals and the university. He had trailed one of the worst offenders to the West End, and discovered to his horror that the plant was owned formerly by the town council, and now by a nationalised industry.

Sir Patrick estimated that smoke, smog, and fog were costing Scotland £25 mill. a year. 'We have been tinkering with this problem since 1839,' he said. 'The Government and the local authorities can be implored to prevent smoke, but unless they are supported whole-heartedly by an intelligent and patriotic citizenry they cannot give effect to the legislation which may be enacted. 'The smoke evil must be tackled in the same way as smallpox, typhoid, scarlet fever, diphtheria, and other diseases, which means that everybody must help in the crusade to make Scotland the healthiest and cleanest country in the world. The Government has promised that legislation will be introduced this session, but it is up to us to see that the promise is fulfilled before October, when a General Election may take place.'

Practical Training

Mr. John Innes, President of the Scottish Division of the National Smoke Abatement Society and Chief Sanitary Inspector of Paisley, envisaged that local authorities, on whom the main responsibility for enforcement would fall, must have adequate qualified staffs effectively to discharge their duties. Mr. Innes claimed that, given the necessary assistance and facilities for training, sanitary inspectors could continue their responsibility. He observed that technical education authorities should consider and arrange theoretical and practical training courses for inspectors, and said he felt no anxiety on the prospect if prompt action was taken.

Dr. Stuart Laidlaw, Medical Officer of Health for Glasgow, said he had no doubt that had the London fog occurred elsewhere than in London itself Parliament would never have acted so rapidly, and this must have driven home the lesson more forcibly than any amount of propaganda.

Advantages of Gas

Mr. Alex. Bujnowski, M.C., Sales and Service Superintendent, Scottish Gas Board, Glasgow, who deputised for Mr. Charles Murdoch, C.B.E., Member of the Board, said every gas-fired installation was a real contribution to smoke abatement. The advantages of gas for heat treatment processes were recognized by industrialists all over the country. Accurate control of furnace temperature or atmosphere was maintained either by hand or automatically by thermostatic devices; this reduced the risk of spoilage, speeded production, and led to a higher standard of quality in the product. Gas, moreover, was a fuel which required no storage, and practically no attention; it was smokeless, and thus ensured clean and healthy conditions in workshop and factory. Finally, the consumption of gas could be accurately accounted for, because the unit by which it was sold, the therm, was a measured quantity of heat.

Mr. Henry F. H. Jones, Deputy Chairman of the Gas Council, had stated that coke, excluding breeze, accounted for more than half the smokeless fuel available for the domestic market. Glasgow Corporation and other builders had, since the first war, built some 80,000 houses each equipped with gas cooker, gas boiler, and at least one gas fire. When it was considered that each of the tenants previously used a coal range it was evident that in that city there was already a substantial contribution being made to smoke abatement.

In the proposed smokeless zone in Glasgow the tenants must ensure that no smoke was emitted from the houses. The gas industry could provide that condition by supplying cookers, fires, water heaters, and refrigerators, all completely smokeless in operation, on attractive hire purchase terms. There was still the open fire which it was agreed would be with us for a long time. However, this could be a coke fire. Coke was clean, smokeless, and economic, because 16 cwt. of coke burnt in a modern appliance, was equal to one ton of coal as burned in the older types. Not every grate would burn coke because of the combustion characteristics. However, there were many excellent types on the market and it might be possible to devise some type of conversion of existing appliances.

Problem of Cost

The problem of cost was national, but, in his opinion, the cost of providing the complete facilities should fall on the local authorities who were virtually the executives of the country. In many cases this cost would amount to approximately £6 per house, which was practically the same as the present amount per head of population spent in one year on the repair of damage resulting from smoke. If the authorities would accept and apply this real and positive responsibility, then in a reasonable time they would realize the benefit in the health of the people and elimination of damage to property. He concluded by submitting that gas made and could make a still greater contribution to smoke abatement, and that the gas industry could increase the efficiency of national energy utilization.

The conference sent a resolution to the Government thanking them for their pledge that legislation for the prevention of smoke and fog was to be introduced, and indicating that the conference would like this measure passed before October.

The National Arbitration Tribunal (Northern Ireland) has awarded an increase of 1s. per shift to certain members of the National Union of General and Municipal Workers employed at Armagh gasworks.

GAS CONSULTATIVE COUNCILS

Old Cookers of No Value

The Eastern Gas Consultative Council, at its meeting at the Connaught Rooms, W.C.2, on February 21 (Lieut.-Col. R. I. Musson, M.C., C.C., presiding), again discussed the question of whether the Gas Board should make an allowance on an old cooker when a new one was purchased. On this matter being referred on previous occasions to the Board, it had refused to make such an allowance, for its view was that since old cookers are of no value, any allowance given would merely represent a cut in the profit margin, thus increasing the net cost of distribution and consumer service and leading in turn to an increase in the price of gas. Owing to its distance from the coalfields, the Board faces the highest coal costs of any Board in the country and in consequence gas prices are among the highest prevailing. It is therefore not willing to do anything that would increase prices for its prime consideration was to keep down the price of gas.

The Council, however, felt that although sales of new appliances were good at the present time, with the growing competition from other fuels, it would be in the best interests to make a small allowance, and after a long discussion, although it was not unanimous, it was resolved to record disapproval of the policy of the Board in continuing to refuse to make an allowance on an old cooker when a new one is purchased, having in mind increasing, as far as possible, the number of satisfied consumers.

In receiving the minutes of meetings of its Divisional Committees, the Council noted that the Watford Committee had recorded its concern that the Eastern Gas Board was still paying a higher price for coal than any other gas board. The Committee appreciated that in its efforts to offset these costs, the Board was pursuing a policy of closing down small works, and of concentrating production at more economic centres and of high pressure distribution and integration. The Committee asked whether it was possible to carry this policy of centralized production and high pressure distribution to its logical conclusion—to produce gas in the coalfields and distribute through a national grid. Was it not a fact that the Board was spending large sums in constructing and enlarging works which would always be a considerable distance from the coalfields?

The Board's comments on this question, which were before the Council, were that the idea behind it had not been lost sight of by the gas industry, and the Gas Council had formed joint planning panels and, as far as the Eastern Board was concerned, meetings had been held at which preliminary discussions had taken place in regard to the best points from which gas could be imported into the area and from where such gas should come. When these questions had been decided, the economics of any scheme for the importation of gas or the export of gas would be considered. The Eastern Gas Board would naturally have regard to the cheapest form of making gas, whether it be made at its works or the works of another board, or even on the coalfield. The Board had previously informed the Council of the plans which it had under consideration for obtaining gas from coke ovens on the coalfields. Any such scheme would take some time to implement even when the final plans had been agreed by all parties.

Standard Charge Too Rigid

The South Eastern Gas Board's standard charge for fixing cookers was discussed again at a meeting of the South Eastern Gas Consultative Council at Caxton Hall, Westminster, on February 1, presided over by Councillor A. B. Constable, who said he had been told that in another area an interim arrangement had been established wherein charges of 4s. and 10s. had been agreed for disconnection and reconnection respectively of a consumer's own cooker. He felt it would be reasonable to ask the Board to divorce jobs of a simple nature and establish a separate standard charge at some suitable figure.

Lieut.-Col. T. H. Newey recalled that the Board had informed the Council that the standard charge of one guinea represented an average cost, and he thought it might be suggested that that figure should be increased for more expensive installations to compensate for loss of income as a result of a lower standard charge for certain cases.

A resolution was passed recording the opinion that the standard charge of one guinea is excessive in the case of most reconnections of consumers' own cookers. While recognizing that the charge had been assessed as an average the Council pointed out that the majority of cases related to the supply and fixing of new cookers, and it asked for further consideration with a view to the establishment of a secondary standard charge for reconnections at approximately 10s. 6d.

Some time ago the Council appointed an Industrial Committee as a result of a suggestion emanating from the Ministry of Fuel and Power. In view of the fact that the committee had been convened on only one occasion and that its conclusions were eventually considered by the Council, it was suggested that no useful purpose would be served in keeping the committee alive.

It was generally agreed that a large number of industrial consumers made representations, if necessary, either direct to the Ministry or to the Gas Board, although it was emphasized that the Council could not be held responsible for that state of affairs since within its limited scope it had afforded as much publicity as possible to the public in general, including industrial consumers, it was agreed to dissolve the committee.

GAS COUNCIL 'IDEAL HOME' PREVIEW

It is a significant sign of the gas industry's vigorous growth and of the ever-widening public interest which gas can command that the Gas Council found it necessary, this year, to entertain members of the Press and representatives of gas boards and appliance manufacturers at Caxton Hall in London for their annual 'Ideal Home' preview. In previous years, this popular exposition of the Gas Council's stand for the exhibition has taken place at Gas Industry House but now, as Sir Harold Smith said at Caxton Hall, the growing numbers of people desirous of attending the preview has caused the Gas Council to seek other accommodation for the event.

The preview on February 24 drew a large attendance from all sections of the Press and it is interesting to note that, among the guests, were several Editors-in-Chief from Sweden. These gentlemen were referred to by Sir Harold when, supported by Mr. R. J. Gregg, Publicity Manager to the Gas Council, and Mr. R. S. Hinder, Press and Information Officer to the Gas Council, he made a short speech welcoming the guests and explaining briefly the theme of this year's stand which is summed up in the words, 'The Happy Home'.

A main feature of the Gas Council's stand is the three gas kitchens, each completely equipped down to the last detail, and each representing a particular type common to our domestic scene. As a supplementary theme in the kitchens themselves is the firm accent on colour schemes and the important part colour can play in the well-designed kitchen. The large kitchen on the stand represents that facing the chilly north and is decorated in warm tones of red and cream, while the medium-sized one, which is lucky to be filled with sunshine, is coolly refreshing in soft greens and yellows. On the other hand, the small kitchen with the dull aspect of so many of our modern kitchens, is in ice blue and clear yellows to make the most of the light while, at the same time, giving a feeling of warmth in winter, by virtue of the pink tones introduced here and there.

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates: Home and Empire:—52/- per annum; Foreign:—60/- per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 2/- per line (approx. 7 words)—minimum charge 10/-. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10 in. deep × 7 in. wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30. *Telephone:* Kings Norton 3868

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN REPRESENTATIVE: A. Engelhardt, 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Central 2236-7

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APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

BOLTON METAL PRODUCTS LTD. require an experienced SALES REPRESENTATIVE to cover the North Western and North Eastern Gas Board areas. Apply stating age, experience and salary required to: Sales Manager, Bolton Metal Products, Ltd., Duckworth Street, Daubhill, Bolton.

OLD-ESTABLISHED gas meter firm in the London area require experimental engineer for their Research Department. He should have practical knowledge of the operation of all types of machine tools and be capable of making prototype mechanisms completely. Applicants should have completed National Service and preference will be given where an Ordinary or Higher National Certificate, Mechanical, is held and an indentured apprenticeship completed. Please write in the first instance giving the following details:—Age, experience and salary required to: No. 229, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION
DRAUGHTSMAN—
DIVISIONAL DRAWING OFFICE

APPLICATIONS are invited for the above position which is located at Dudley.

Candidates must have had a good mechanical and structural experience and a knowledge of Gasworks requirements would be an advantage.

The salary for the post will be within Grade 7 (£585-£665 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, giving full details of age and experience together with the names of two referees, should be addressed to Mr. Stanley Jones, Divisional General Manager, West Midlands Gas Board, Wolverhampton and District Division, Kensington House, Bath Street, Dudley, to reach him within fifteen days of the appearance of this advertisement.

J. C. INGRAM,
Secretary to the Board.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited for the following pensionable appointments:—

SOUTH LANCASHIRE GROUP
GROUP TRAINING AND EDUCATION OFFICER

The commencing salary will be £1,075 per annum.

Applicants must possess a university degree and/or be a corporate member of one of the professional engineering institutions. Responsible experience in the gas industry is desirable.

Further particulars, including details of the responsibilities of Group Training and Education Officers, may be obtained from the Secretary, N.W.G.B., 60, Whitworth Street, Manchester, 1, to whom applications should be returned within fourteen days.

WIRRAL GROUP
ASSISTANT DISTRICT ENGINEERS (DISTRIBUTION)—
WALLASEY AND CHESTER DISTRIBUTION ENGINEERING DEPTS.

The normal period of work will be 44 hours per week, and the salary will be within Grade A.P.T. 6 (£530/£610 per annum).

The successful applicants will be responsible to the District Engineers (Distribution) for the supervision of distribution engineering work in their respective districts, whether by direct labour or contract.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (Wirral Group), Hind Street, Birkenhead, within fourteen days.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited from suitably qualified persons for the following pensionable appointments:—

NORTHERN GROUP
TECHNICAL ASSISTANT (PRODUCTION)—
LANCASTER DISTRICT

The salary will be within Grade A.P.T. 7 (£585/£665 per annum).

The successful candidate will be responsible to the Production Engineer for the chemical control of all plant on the Morecambe Undertaking and the new C.W.G. plant at White Lund, and will be required to give technical assistance on the three smaller Undertakings in the district. He may also be required to deputise for the local Manager on any of the smaller Undertakings in an emergency.

Applicants should have a sound training in gas engineering with experience in operation and maintenance of horizontal retorts and C.W.G. plant.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B., (Northern Group), St. George's Quay, Lancaster, within fourteen days.

WIRRAL GROUP
ASSISTANT DISTRICT ENGINEERS (DISTRIBUTION)—
WALLASEY AND CHESTER DISTRIBUTION ENGINEERING DEPTS.

The normal period of work will be 44 hours per week, and the salary will be within Grade A.P.T. 6 (£530/£610 per annum).

The successful applicants will be responsible to the District Engineers (Distribution) for the supervision of distribution engineering work in their respective districts, whether by direct labour or contract.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (Wirral Group), Hind Street, Birkenhead, within fourteen days.

(*Classified advertisements continued on page* 602)

APPOINTMENTS VACANT (ctd.)

NORTHERN GAS BOARD

WESTERN GROUP
TECHNICAL ASSISTANT—
CARLISLE DIVISION

APPLICATIONS are invited for the above appointment.

Applicants should be experienced in the operation and maintenance of continuous vertical retorts with modern ancillary plant.

The salary will be in accordance with Grade A.P.T. 6 of the National Salary Scales (£530-£610 per annum).

The successful applicant will be required to pass a medical examination and be subject to the provisions of the Board's Staff Pension Scheme.

Applications stating age, training, qualifications and experience should be addressed to the Divisional General Manager, Gas Works, Rome Street, Carlisle, not later than March 15, 1955.

A. R. CROFT,
Group General Manager.

February 17, 1955.

SCOTTISH GAS BOARD

GLASGOW DIVISION
GLASGOW DISTRICT
CHIEF ASSISTANT—SHOWROOMS
A.P.T. IX (Provincial 'A') £655-£755 per annum

APPLICATIONS are invited from suitably qualified persons for the above position.

The duties will include Management of the District Showrooms, control of Sales Staff, Displays and Sales Drives, with the appropriate advertising and publicity.

The post is superannuable and the successful candidate may be required to pass a medical examination.

Applications stating age, experience and qualifications, together with the names of two referees, should be sent to the undersigned not later than March 16, 1955.

D. F. YOUNG,
Divisional Controller.

30 John Street
Glasgow, C.1.

SCOTTISH GAS BOARD

EDINBURGH DIVISION
EDINBURGH DISTRICT
GASFITTING SUPERINTENDENT

APPLICATIONS are invited for the position of GASFITTING SUPERINTENDENT in the Edinburgh District. Applicants must be experienced in all branches of gas utilisation, appliance installation and maintenance. Sound training and experience in the planning of work, preparation of estimates and supervision of gasfitters is essential.

The salary will be within Grade A.P.T. 12, Provincial 'A', £790/£915 per annum with placing according to qualifications and experience. The post is superannuable and the successful candidate may be required to pass a medical examination.

Arrangements are being made for the provision, in the near future, of a modern dwelling house to be let to the successful candidate at a reasonable rental.

Applications stating age, qualifications and experience, together with the names of two referees, should be addressed to the undersigned on or before Wednesday, March 23, 1955.

DAVID BEAVIS,
Divisional Controller.

Scottish Gas Board,
Edinburgh Division,
15, Calton Hill,
Edinburgh, 1.

SCOTTISH GAS BOARD

GLASGOW DIVISION
GLASGOW DISTRICT
SUPERINTENDENT—
MAINTENANCE SECTION
Grade A.P.T. IX (Provincial 'A')—£655-£755

APPLICATIONS are invited for the above position.

Candidates should have experience of installation and maintenance of all types of Domestic and Industrial Appliances, and preferably have qualifications in Gas Supply or Engineering.

The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications endorsed 'S/MS'. stating age, experience and qualifications, together with the names of two referees, should be sent to the undersigned not later than March 21, 1955.

D. F. YOUNG,
Divisional Controller.

30, John Street,
Glasgow, C.1.

SCOTTISH GAS BOARD

GLASGOW DIVISION
GLASGOW DISTRICT
SENIOR TECHNICAL ASSISTANT
ENGINEERING STAFF
A.P.T. IX-X (Provincial 'A')
£655-£815 per annum

APPLICATIONS are invited from suitably qualified persons for the post of SENIOR TECHNICAL ASSISTANT in the Headquarters Engineering Staff.

Candidates should possess, by examination, a recognised qualification in Engineering or Fuel Technology and should have had a general engineering training, while practical experience in Steam Generation and Utilisation would be an advantage.

The post is pensionable and the successful candidate may be required to undergo medical examination.

The salary will be within the Scale (Provincial 'A') Grades IX-X (£655-£815 per annum) with placing therein, according to experience and qualifications.

Applications, endorsed 'S.T.A. (ENG.)' stating age, training, qualifications and experience, together with the names of two referees, should be in the hands of the undersigned not later than Monday, March 21, 1955.

DONALD F. YOUNG,
Divisional Controller.

City Chambers,
30, John Street, Glasgow, C.1.

EASTERN GAS BOARD

IPSWICH DIVISION
INDUSTRIAL GAS ENGINEER

APPLICATIONS are invited for the position of an INDUSTRIAL GAS ENGINEER in the Ipswich Division. Applicants should have had experience in the design, construction and installation of industrial and commercial plant covering a range of representative industries. Duties will include contacting Industrialists in the Division and carrying out surveys, etc.

The commencing salary will be within Grade A.P.T. 12, Provincial 'A' (£790-£915) and the initial placing on the Scale will be according to experience and qualifications.

The successful candidate may be required to pass a medical examination, and unless already subject to a pension scheme, by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications stating age and giving full particulars of education, training and qualifications and experience, should be sent not later than March 26, 1955, to the General Manager, Ipswich Division, Eastern Gas Board, Crane Hill Lodge, London Road, Ipswich, Suffolk, endorsed 'Industrial Gas Engineer'.

EASTERN GAS BOARD

TOTTENHAM DIVISION
MECHANICAL ENGINEERING ASSISTANT

APPLICATIONS are invited for the appointment of MECHANICAL ENGINEERING ASSISTANT at the Willoughby Lane Works.

Applicants, who should be between the ages of 25 and 33 years, will be required to carry out inspections and to programme maintenance work on mechanical plant, ancillary to retort house installations and water gas plant, including coal and coke handling plants.

Preference will be given to those applicants possessing a Higher Grade National Certificate in Mechanical Engineering or equivalent and the salary will be in accordance with Grades A.P.T. 6/7 (£560-£695) of the National Salary Scales for Gas Staffs according to qualifications and experience.

The successful applicant may be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required if eligible to join the Eastern Gas Staff Pension Scheme within six months from taking up the appointment.

Applications, giving full details and particulars of training, experience and qualifications, should be forwarded to the Divisional Personnel Manager, Eastern Gas Board (Tottenham Division), Woodall House, 658, Lordship Lane, Wood Green, N.22, not later than March 16, 1955.

THE GAS COUNCIL

SCIENTIFIC SECRETARY

APPLICATIONS are invited for the appointment of SCIENTIFIC SECRETARY to the Gas Council at a salary of the order of £2,500 per annum. The successful applicant will be expected generally to advise on scientific matters and particularly to act on behalf of the Research Committee of the Gas Council in maintaining liaison between that committee, the Directors in charge of the Council's Research Stations, the various research associations and other organisations conducting research with which the Gas Council may be associated. The successful candidate must have had considerable experience in the direction of research and should be able to show a proper appreciation of the relationship between research and commercial development. While the directors in charge of research stations will maintain their full responsibilities to the Gas Council for the conduct of their stations, the Scientific Secretary must be fully qualified to discuss with them the various lines of investigation in hand or projected. The appointment will be pensionable, unless the successful applicant is over 55 years of age on appointment.

Applications, giving full particulars of academic qualifications and appointments held, should be sent to reach the Secretary, The Gas Council, 1, Grosvenor Place, London, S.W.1, not later than April 16, 1955.

MISCELLANEOUS

SMALL single truckloads and larger quantities of good ROUGH BREEZE from any gasworks, large or small, in the United Kingdom required by merchants paying own railway tolls. Cash price and particulars to: No. 9378, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

APPOINTMENT WANTED

REPRESENTATIVE, aged 40, Assoc. of I.G.E. centred in Cheltenham, well established connection West Midlands, S.W., Southern and Wales Boards, also Builder's and Plumber's Merchants, desires commission representation for reputable manufacturers. Apply: No. 230, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

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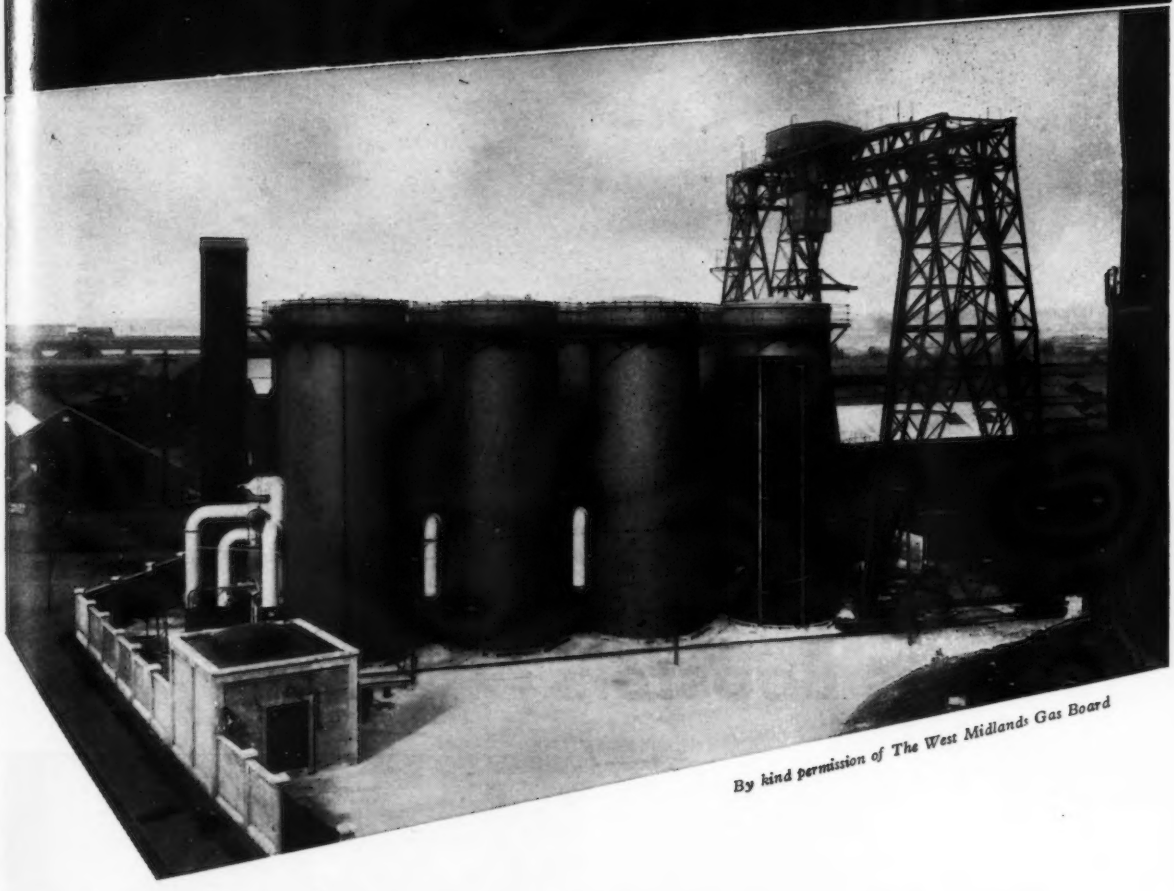

By kind permission of The West Midlands Gas Board

A tight corner . . .

The Tower Purifiers above are installed on a long, narrow site between a Gasholder and the Works boundary. The Towers are placed at one end of the site. A covered space at the other end, with plant for mechanical loading and mechanically assisted unloading of containers, ensures smooth and easy handling of oxide.

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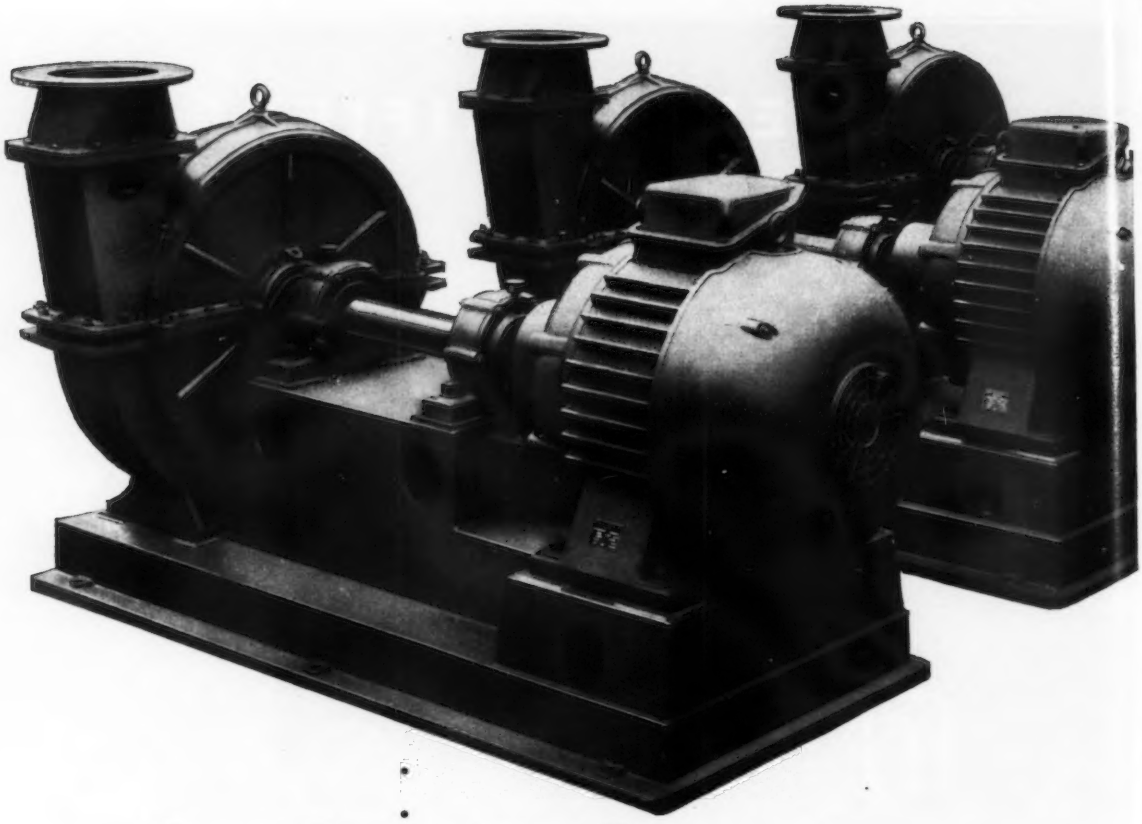
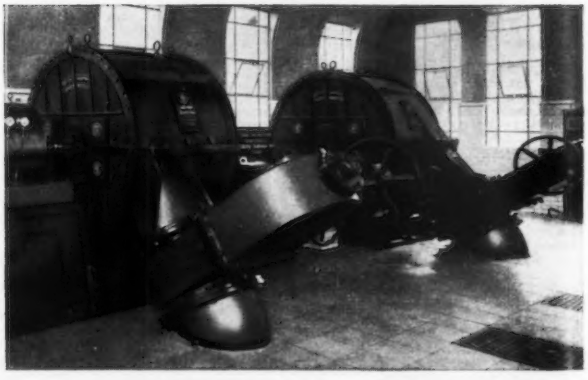
C1681-1



Gas Boosters?



EXAMPLES of gas boosting fans with cast iron casings are illustrated here. They represent the results of special attention to the design and development of robust, trouble-free boosters over the years. This experience provides fans for handling volumes of 5,000 to 1½ million cubic feet of gas per hour at pressures up to several pounds per square inch.
When the time comes you'll find there's no easier way to solve your air or gas moving problem than to put it to Keith Blackman.

contact **Keith Blackman Ltd**

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T.A.722[illegible]

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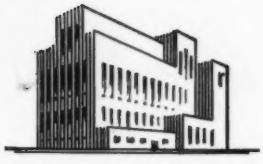
SYSTEMS

one aim . . .

GLOVER – WEST

CONTINUOUS VERTICAL RETORTS . . . . . .



C.O.L

INTERMITTENT VERTICAL CHAMBERS . . . .

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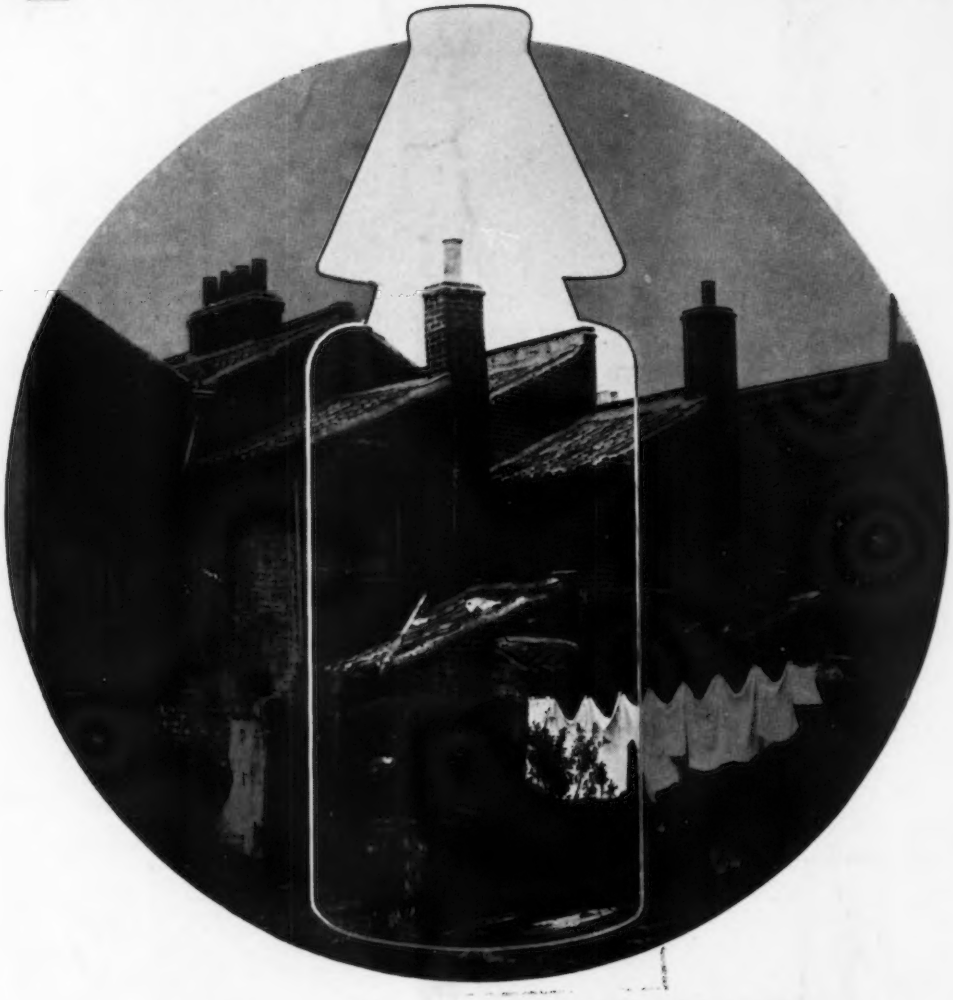
GC1

Operation Rescue



and ASCOT

Since one of the important objectives of Operation Rescue is the provision of a hot water supply, the merits of the Ascot system will come under review when plans for improvement or conversion are considered.

It will be found in many cases that the most economical and efficient method of providing hot water will be an Ascot — a multipoint, a bath water heater, or a sink water heater, or perhaps a combination of the last two.

Ascot heaters are, for the service they give, inexpensive to buy. Often they are cheaper to install than some other popular systems because the pipe runs are simple.

They do not burn raw coal, which is in the interests of the householder, his neighbours, and the whole nation.

Because they heat only the water actually required Ascots are economical in use.

Finally, and really most important, they give the householder a first-class hot water service from which he and his family can get piping hot water instantly day or night in an endless flow. Only of an instantaneous gas water heater can it be said that

ASCOT

It never runs cold

The Ascot Technical Department offers full co-operation, and invites inquiries

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WHG/A.101